

# TECHNOLOGY

**REVIEW** *April* 1951

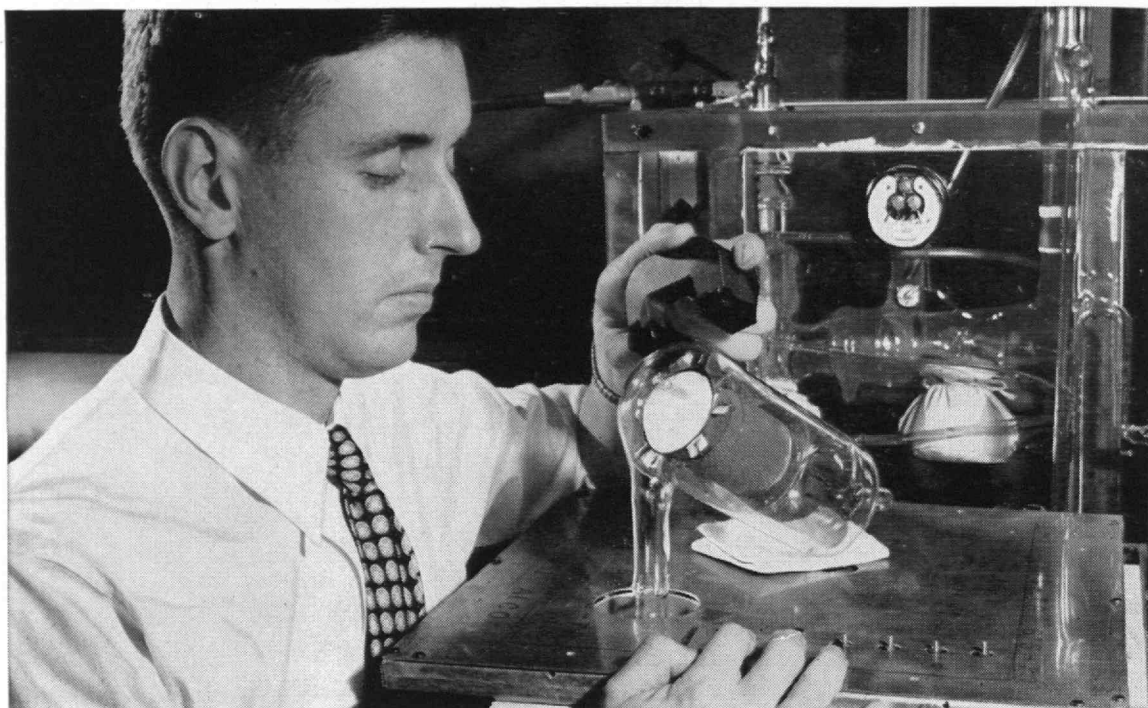


# technology review

Published by MIT

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Arthur E. Anderson, Professor of Electrical Engineering at the University of Connecticut, was one of the 21 college professors who spent the summer months last year working with the men who design and build electrical equipment for the Westinghouse Electric Corporation. The program is designed to provide college instructors with practical experience in industry. Here, as part of a research project, Mr. Anderson is using a small magnet to change the position of a metal disc enclosed in a glass tube.

## Westinghouse Plan Enables Professors to Deal with Actual Industrial Problems...

Through a "lend-lease" program with leading engineering colleges, Westinghouse hopes to enable professors of those schools to get a greater understanding of industrial research, design and manufacturing problems.

Here's the way the plan works: professors from co-operating engineering schools spend their summer months at Westinghouse—actually helping to design and build electrical equipment they discuss in their classrooms. They work side by side with Westinghouse men who design and build electrical apparatus.

In this way, Westinghouse hopes to contribute to the flow of well-trained and competent engineers coming from America's educational institutions.

Other Westinghouse co-operation with colleges is by supporting 42 fellowships, 149 scholarships, 5 professorships, and a graduate study program through which Westinghouse employees may work toward advanced degrees at seven co-operating universities.

These activities indicate the breadth of Westinghouse interest in furthering scientific development. Westinghouse Electric Corporation, Pittsburgh 30, Pa.

G-10135

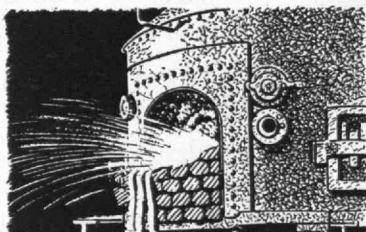
## YOU CAN BE SURE..IF IT'S Westinghouse



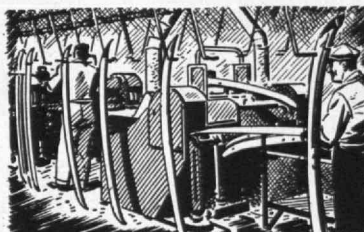
IT'S ESSENTIAL TO SAFETY!

## WHAT IS IT?

☐ bumper guard   ☐ radar component   ☐ lighthouse reflector



**IT'S MADE OF STEEL** melted in a furnace at tremendous temperature. In such furnaces the slag (impurities) discharges through slag hole blocks of Norton Cystolon\*—a densely bonded silicon carbide grain that resists temperatures up to 3050° F.



**IT'S CHROMIUM-PLATED**, highly polished. Such products, of widely varying types, receive their attractive, mirror-like finish from a series of polishing operations, in which set-up wheels coated with Norton Alundum\* abrasives are used.

**DID YOU RECOGNIZE IT?** It's a bumper guard. But radar components, lighthouse reflectors and endless other products are also made with the aid of Norton. For, besides the world's largest output of abrasives and abrasive products, the wide scope of Norton's manufacture includes refractories and many other products vital to industrial processes.

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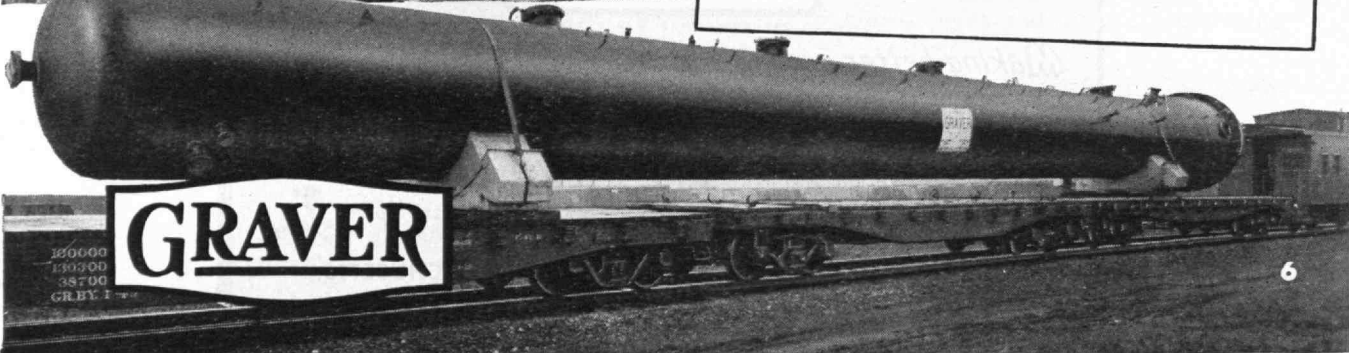
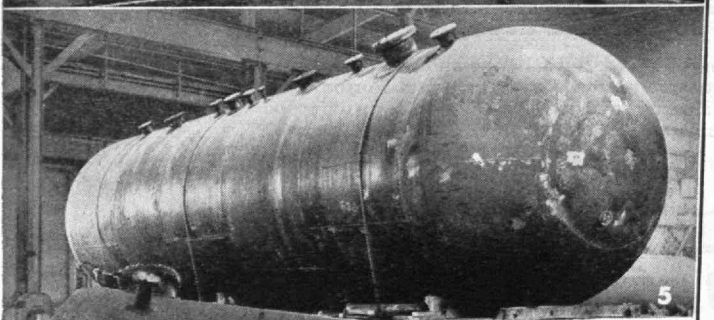
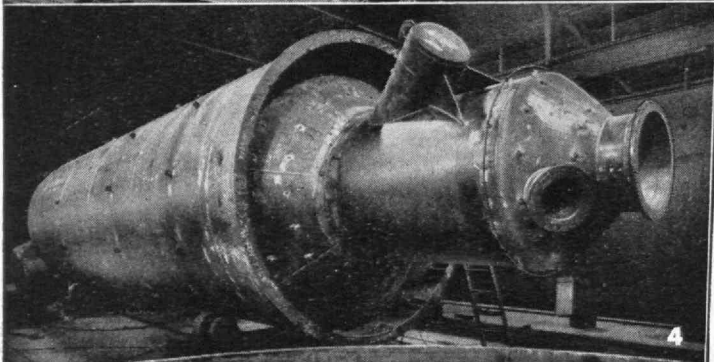
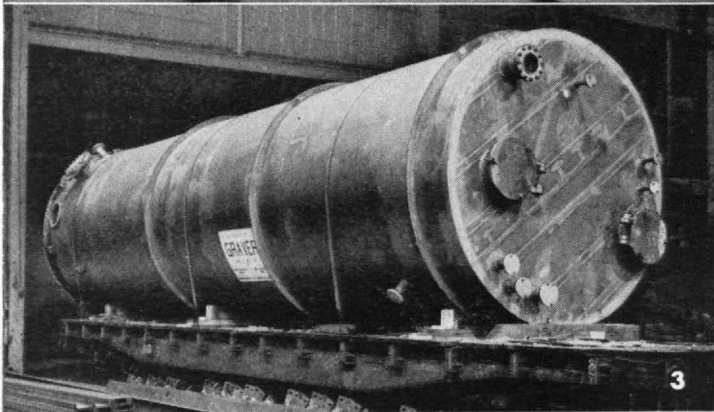
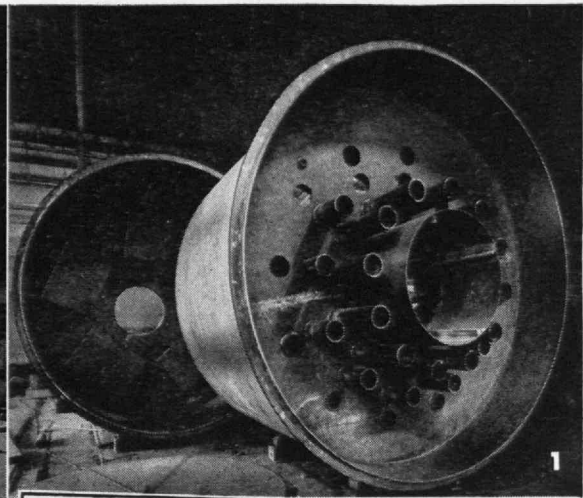
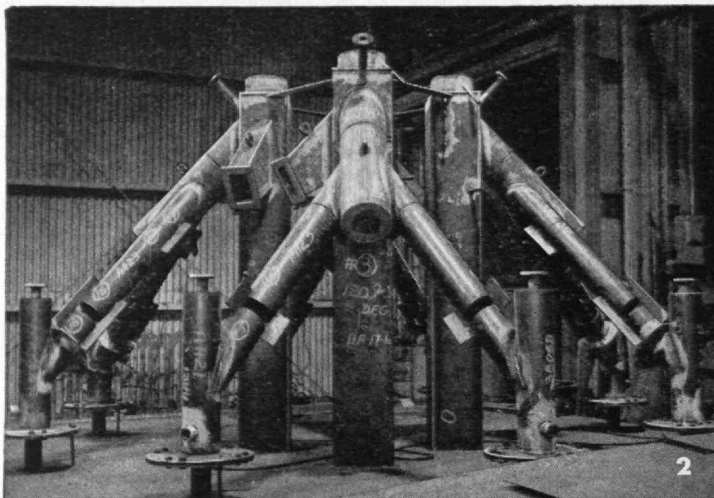
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BEHR-MANNING, TROY, N. Y. IS A DIVISION OF NORTON COMPANY





## RECENT REFINERY VESSELS FROM GRAVER SHOPS

These pictures show the significant part Graver is taking in the modernization and expansion of the nation's refinery facilities.

1. Two sections of a Separator Surge Tank, 14'0" x 35'2"
2. Part of a Catalyst Airlift
3. Fines and Fresh Catalyst Storage Bin, 12'0" x 48'3"
4. Houdry Process Vessel of molybdenum steel, 12'0" x 50'0"
5. Desalting Tank, 12'0" x 40'0"
6. Refinery Tower, 7'0" x 102'11"

These fabrications are exhibits of Graver versatility and indicate the extent of Graver Services to the petroleum industry.

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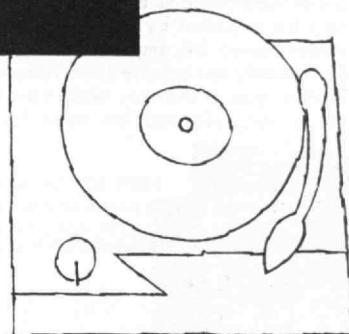
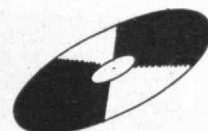
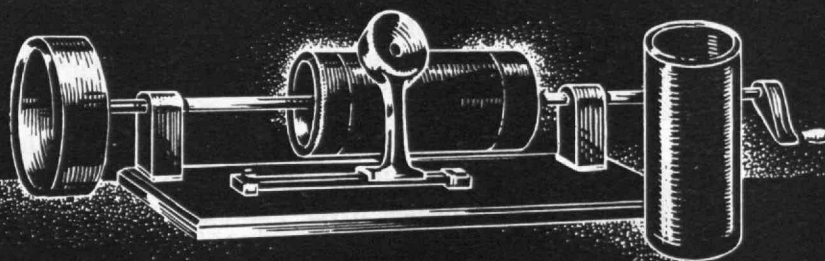
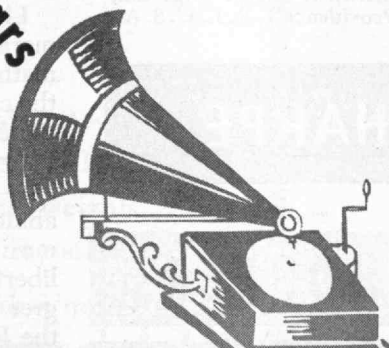
Carbon black brings music to your ears

*Carbon black has always had a definite place in the manufacture of phonograph records.*

*Its use dates back to the time when records looked like dictaphone cylinders and there was music only on one side.*

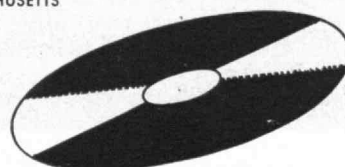
*All carbon blacks used in the industry are added primarily for their coloring power, and possible lubricant value.*

*CABOT carbon black makes it easy to recognize the best quality record. It gives that shiny, jet-black appearance music lovers accept as the hallmark of an excellent record.*



**GODFREY L. CABOT, INC.**

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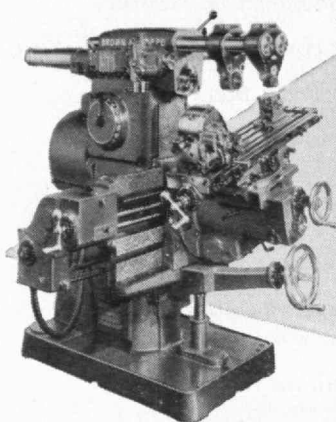




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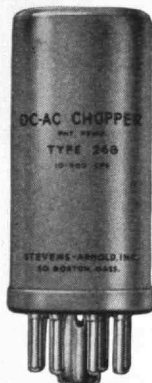
tachments, jigs, fixtures, or resetting work on the table. Saves set-up and machining time. Ideal for toolrooms, experimental laboratories, and small-quantity production plants. Write for complete information. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

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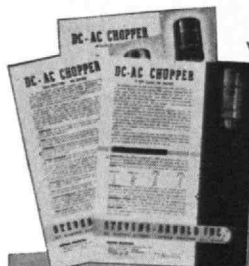
## DC-AC CHOPPER

A model for every use — 60 and 400 cycles  
Single pole and double pole — Make-before-break contacts — Contacts in air or in liquid

These Choppers convert low level DC into pulsating DC or AC, so that servo-mechanism error voltages and the output of thermocouples and strain gauges may be amplified by means of an AC rather than a DC amplifier. They are hermetically sealed, precision vibrators having special features which contribute to long life and low noise level.



WRITE FOR CATALOGS...  
#246B, 60 cycles, AC  
#280, 400 cycles, AC



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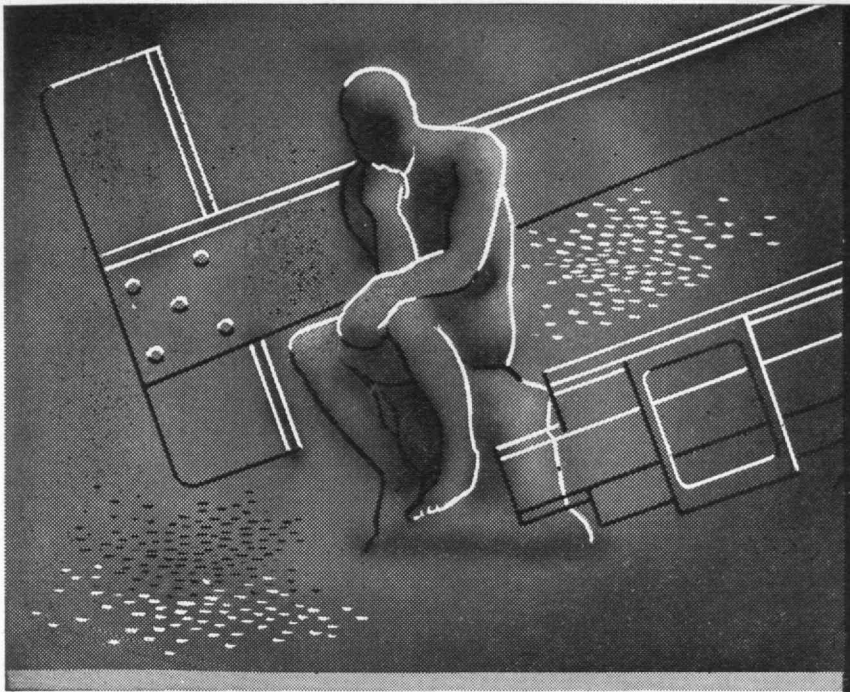
22 ELKINS STREET, SOUTH BOSTON 27, MASS.

## THE TABULAR VIEW

**Great Dream.** — For centuries, while the geographical areas of the world's known land masses were being gradually expanded, men feared the Great Unknown Southland as an obstruction to land travel; later *Terra Australis* was looked upon as a vast expanse of rich land awaiting exploitation and colonization. But the hardy, fearsome sailors of an earlier era found that no matter how far their travels carried them, the Great Southland always receded out of reach. What comedy of errors led to the age-old belief that such a region ever existed is discussed in the first installment of a two-part article (page 292) by **WILLY LEY**. Like other articles Mr. Ley has written for *The Review* as one of its editorial associates, "The Great Dream" echoes his special interest in history and science. Mr. Ley was one of the founders of the German Rocket Society and later became coeditor of its journal. He was science editor of *PM* during the heyday of that New York daily, and spent the years of World War II in research at the Washington Institute of Technology.

**Life's Objective.** — Normally one wouldn't expect morals to be influenced by mathematics. Yet when a mathematician turns philosopher, such may easily be the case. At any rate, starting with the thesis that continued advancement is the goal of all living organisms, **PROFESSOR EMERITUS HENRY B. PHILLIPS** shows (page 298) that most rapid progress occurs when the probability of finding correct solutions to the way of life is maximized, as it is under conditions of individual liberty. Professor Phillips received his bachelor's degree from Erskine College in 1900 and a Ph.D. from the Johns Hopkins University in 1905. He joined the Technology staff in 1907. Professor Phillips became a full professor in 1927 and in 1934 was appointed acting head of the Institute's Department of Mathematics, becoming its head in 1935. He has also been a consulting professor of physics at Brown University, and a lecturer at the University of California. He is author of more than 20 books and scientific papers.

**Charles River Sailing.** — In 1936 an important new sport was brought to Technology with the acquisition of a fleet of sailing dinghies. **WALTER C. WOOD**, '17, sailing master, recalls (page 301) the outstanding influence which the Technology fleet has had — not alone in influencing sports at M.I.T. but in injecting a new spirit of intercollegiate competition in sailing throughout the country. Mr. Wood learned the fundamentals of yachting at an early age at his home in Providence, R.I. He was a member of the committee appointed by Karl T. Compton, chairman of the M.I.T. Corporation, in 1936, to design a boat suitable for racing, as well as for training large numbers of Technology students, and subsequently became master of the M.I.T. Nautical Association. During World War II, he was instructor in sailing at the U.S. Coast Guard Academy in New London, with the rank of lieutenant commander. After the war, he returned to M.I.T. and is now engaged in studies of dinghies constructed from Fiberglas, as the original Technology dinghy fleet nears the end of its useful life.



## Thinking of improving

"Improving" any machine really means increasing its productive capacity. That means tinkering with speeds and weights and strength—ending up with alloy steels.

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Loss of profit through loss of 9 hours production — 40 pieces per hour x \$1.25 per piece x 9.....

**\$0.80 "saved"**

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**450.00 lost**

**NET LOSS \$481.60**

(To say nothing of the re-scheduling headaches involved)

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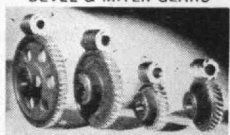
SPUR GEARS



HELICAL GEARS



BEVEL & MITER GEARS



WORMS & WORM GEARS

## MAIL RETURNS

### A Will and a Won't

FROM WILLIAM A. RHODES, '12:

Dr. Paul Meadows,

In "Technological Change and Social Progress,"

In your January issue,

Recognizes difficulties in forecasting sociological change. A step in the proper direction.

For, while — cause — effect — cause — effect — etc.

Is dependable in lifeless matter,

Rendering material sciences and their predictions possible, People are different.

Each person (the cuss) has a will of his own which may act As a primary cause

With or without good, bad, valid, or invalid reason.

At its own option it frequently does so.

Thus, sociological forecasting is not only difficult

But so largely impossible that

Unexpected events and developments are bound to occur.

And they do.

Each person has also a won't.

New York 23, N. Y.

### Performed to a T

FROM ANDREW L. FABENS, '10:

Thank you for your article in the December, 1950, issue of The Review entitled "William T. Sedgwick, Biologist." It has brought up so many pleasant memories of M.I.T.

Professor Sedgwick was such an interesting teacher back in my days of 1907-1910 that those of us who signed up for his general course in public health had to dash to his lectures or we would find our seats and the room filled with others who had not signed up. I think the interlopers outnumbered those who signed up.

In my student days, only one other man had such an appeal. He was Dean Shaler, the geologist at Harvard, who gave his lectures in the Harvard Museum to discourage the influx of visitors.

In my days of reporting for *The Tech*, I got Professor Sedgwick to give me articles each week about his course, but this ended very suddenly and finally when a frivolous printer changed a lecture subject from "Infant Mortality" to "Infant Morality."

Delray Beach, Fla.

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Here in America, modern agricultural methods have increased farm production 60% in the past generation—even though today there are 20% fewer workers on the farms. This increased yield means plenty of food for every one here—and more besides. And the same methods, applied in other countries, would help answer world food needs.

Better seed, fertilizer, and new scientific methods play their part. Equally important are the various chemicals that now fight off blight, disease, and destructive insects. Starting before planting and continuing until the food is ready for our tables, hundreds of new materials increase and protect our food supply.

Even after harvest, man-made agents speed the ripening process. Others guard our food against rodents and insects.

The people of Union Carbide help make possible the high productivity of America's food producers by supplying chemicals for fungicides and insecticides, gases for ripening and preserving, and the stainless steel so important in the preparation and distribution of food. If you have a materials problem, in this field or other fields, it is quite likely they can help you also.

**FREE:** Learn more about the interesting things you use every day. Write for the illustrated booklet "Products and Processes" which tells how science and industry use Union Carbide's Alloys, Chemicals, Carbons, Gases, and Plastics in creating things for you. Write for free booklet B.



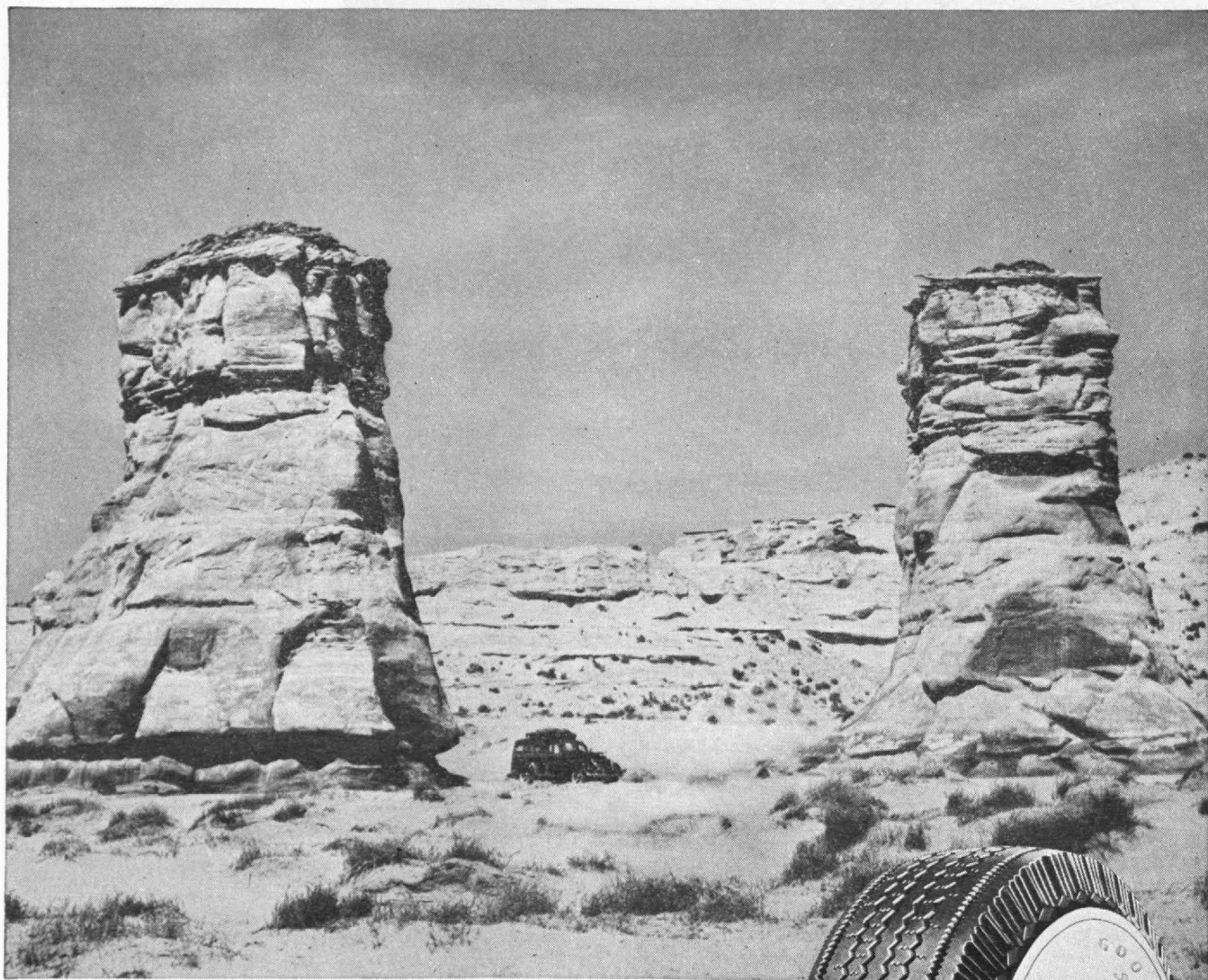
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To get there... **MORE PEOPLE RIDE ON GOODYEAR TIRES  
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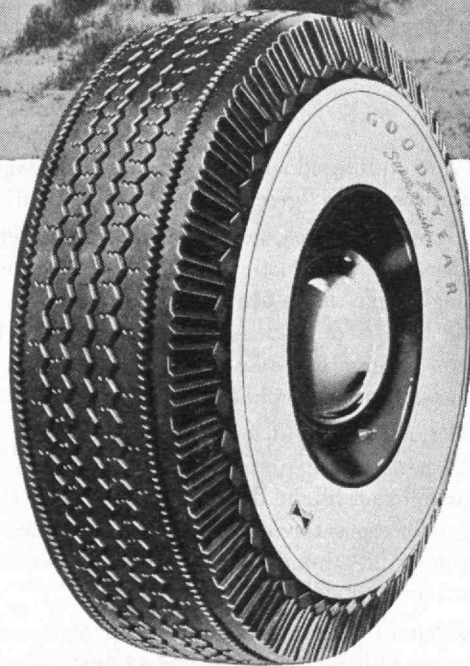
Traveling to the Arizona Desert (above)—or to any other spot in our beautiful country—more cars roll on Goodyear tires than on any other kind. And it's to your *advantage to know why!*

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*Super*  *cushion* by

**GOOD  YEAR**

Super-Cushion, T. M.—The Goodyear Tire & Rubber Company, Akron, Ohio



# THE TECHNOLOGY REVIEW

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John J. Hanrahan from *Black Star*

## *Sentinel at Dusk*



# THE TECHNOLOGY REVIEW

Vol. 53, No. 6



April, 1951

## The Trend of Affairs

### *A Nation of Home Owners*

**T**HE past 10 years of war dislocations and postwar building boom have brought about great changes in the distribution and housing habits of our population. The continuing movement from farm to city should cause no surprise, for it is a trend of long duration. The drift of population from the interior states to the coastal areas, and particularly to the southwest corner of the country, has also received wide publicity. Perhaps less well known is the fact that in spite of the heavy flow from rural areas, the large cities of the country are growing either very slowly or not at all. The reason, of course, is the countertide from the cities into suburbia.

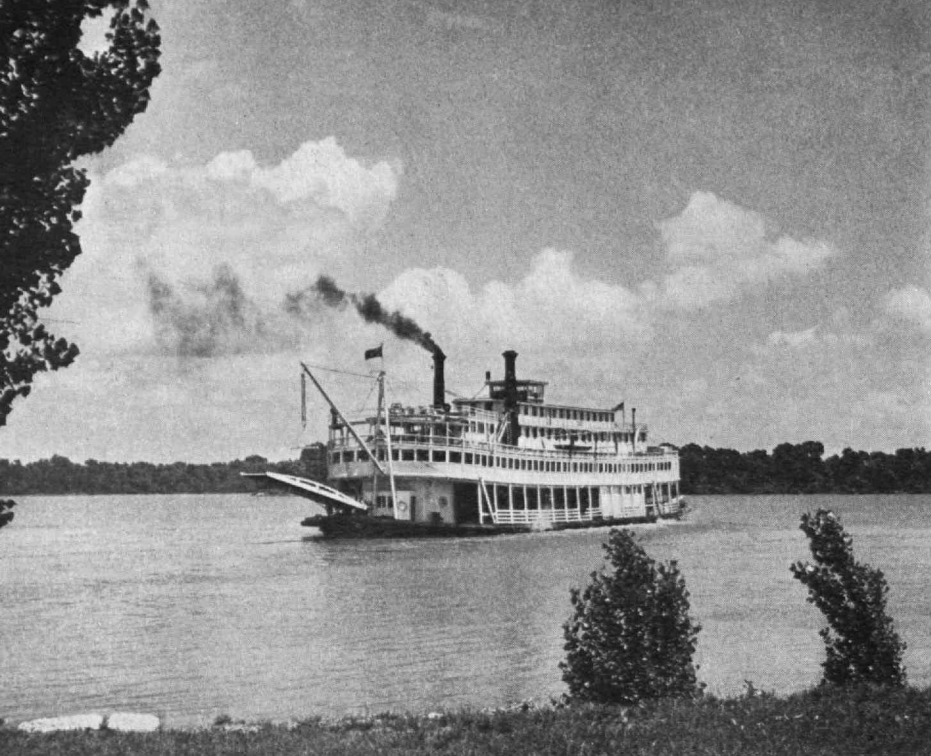
But very likely more important, economically and politically, than any of these trends is a phenomenal rise in home ownership, mainly during the past five years. The United States now has more home owners than tenants. In the past decade the number of home owners, excluding farmers, has almost doubled, rising from 11,413,036 in 1940 to about 22,000,000 in 1950. Some 5,500,000 single family houses were erected during those 10 years, with 2,325,000 of them going up in 1949 and 1950 alone. Over and above mortgages, these individually owned houses represent a net equity of about \$160,000,000,000 — nearly twice the value of bank savings deposits. Though we may be witnessing the decline, we have not yet seen the fall of the landlord. During this period the number of urban tenants dropped to its present level of 13,000,000 — a decrease of 3,000,000.

Spurred by virtually full employment and unparalleled prosperity, American families have followed their desire for a home and a piece of land of their own out into the farms and pastures surrounding our cities. Primarily because of the automobile, this has been an economically and physically feasible move-

ment. By no means a negligible factor in the growth of America's suburbia have been the 35,000,000 children born in this country between 1940 and 1950.

Another powerful incentive has been the dearth of adequate housing, felt most intensely by the middle class, within the cities themselves. A most extreme example of this is to be observed currently in Manhattan which, many observers fear, is slowly being stratified into a two-layer town. A city with the highest percentage of old or substandard dwellings in the New York area, Manhattan has seen luxurious, high-rent apartments built freely by unassisted private capital to the point where signs of a surplus of this type of dwelling are apparent. On the other hand, towering housing developments subsidized by municipal or federal monies have also been created, but generally with some upper limit to the income of the tenants. In the last few years, the only large-scale developments aimed at the middle class that have been constructed on the island of Manhattan are the Metropolitan Life Insurance Company projects on the lower East Side, known as Peter Cooper Village and Stuyvesant Town, containing together 11,250 dwelling units. Some 200,000 applications were received for the 8,755 apartments in Stuyvesant Town before the owners stopped accepting any more. Faced with crowded schools and a dearth of adequate housing, the middle class has no choice but to run for the wide-open spaces of Queens, Nassau, and Westchester counties, or the hills of New Jersey.

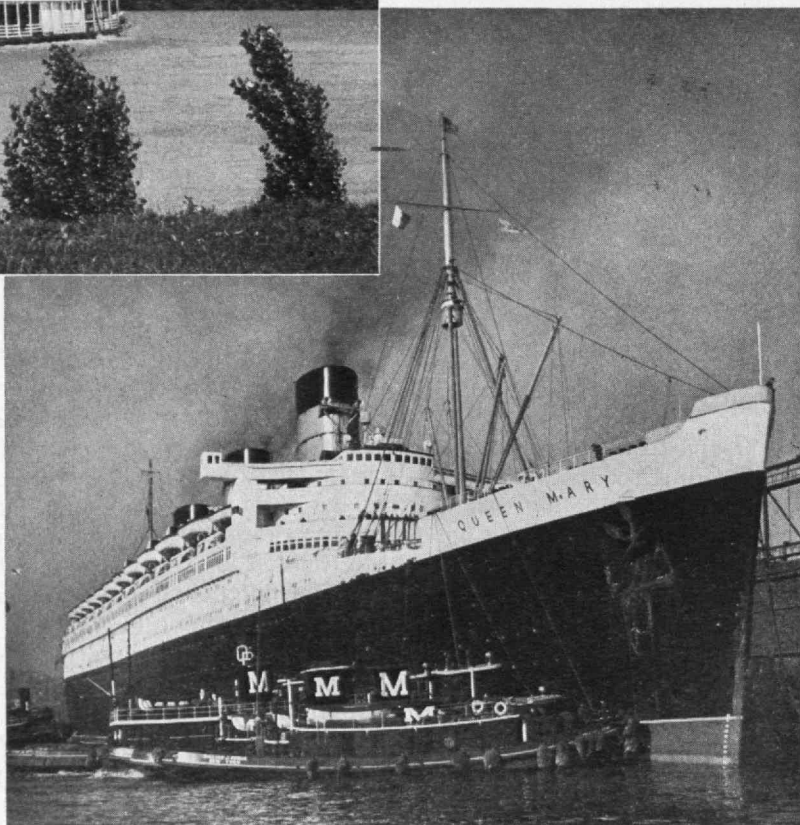
Of the nation's 22,000,000 nonfarmer home owners, nearly 20,000,000 live in single-family houses. (Another 3,000,000 such dwellings are rented.) About 1,500,000 home owners live in this country's 5,250,000 two-family structures, and 300,000 owners occupy space in houses containing three or four flats. Although one is apt to imagine the American urbanite as a cliff dweller, ascending by elevator after his day's work to



Ward Allan Howe

*It is Europeans, for the most part, who have constructed these great ships, but without America they have no meaning. These ships are alive with the supreme ecstasy of the modern world, which is the voyage to America. There is no other experience that is remotely comparable to it, in its sense of joy, its exultancy, its drunken and magnificent hope which, against reason and knowledge, soars into a heaven of fabulous conviction, which believes in the miracle and sees it invariably achieved.*

—Thomas Wolfe



*Got any river they say isn't  
crossable?  
Got any mountains that can't  
be cut through?  
We specialize in the wholly  
impossible,  
Doing things "nobody ever  
could do."*

—Berton Braley

some fifteenth-story domicile, only in New York and Chicago are there more people living in apartment houses than in the smaller dwellings.

Sharing to a growing degree this trend toward home ownership are the nation's many minority groups. Having generally a marginal position in the competition for jobs, their economic situation has been strongly improved, relatively, by the seller's market for labor that has existed during the past decade. They have also been aided greatly by an improving social climate, and by a series of antidiscrimination laws and court decisions. A notable one was that by the Supreme Court in 1948 which ruled that written agreements among property owners against selling to Negroes could not be enforced in court.

The automobile has contributed its share to the development of suburban, and even rural, living; it has even stemmed the trek to the cities. The United States is rapidly becoming a nation of home owners.

## High-Speed Recording

**L**ORD KELVIN's statement, to the effect that knowledge in any field of inquiry remains unsatisfactory and incomplete until the essential characteristics are brought within the compass of measurement, gets to the core of modern science and technology. But the world had a more leisurely pace in Kelvin's time than in the mid-Twentieth Century, and today the mere measurement of quantities no longer suffices by itself. We need to make measurements—precisely, of course—but we need to record them quickly as well. The measurement of physical quantities is not usually too difficult a problem, but the recording of the measured data often sets up obstacles to progress, especially if the counting rate is rapid and the records are desired quickly.

The prompt and accurate recording of data in permanent form is especially significant in processes for which a considerable amount of information must be

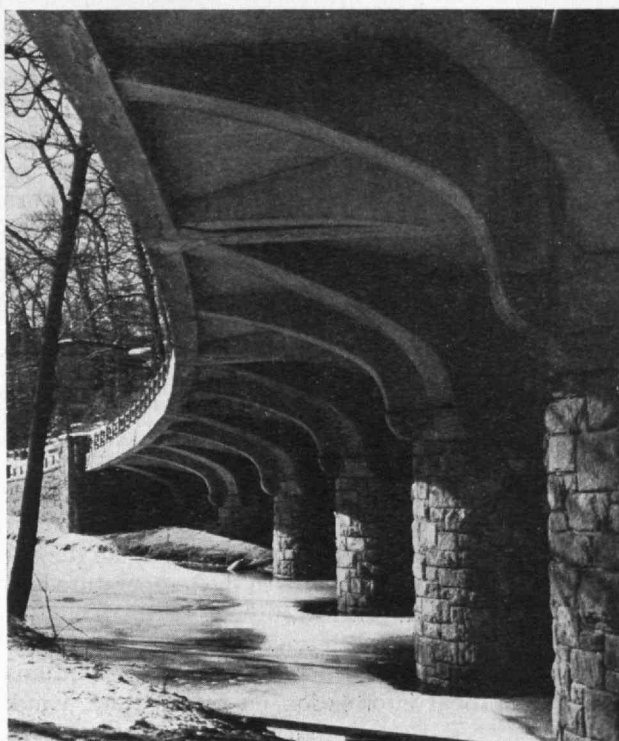
determined rapidly during a relatively brief interval of time. In such cases, of which flight studies of guided missiles may be cited as one example, it is not uncommon for information to be received over a radio telemetering link or perhaps by way of an electric circuit. In this case, information from electrical gauges is transmitted to a receiving point where it has usually been recorded photographically as a function of time. Numerical values of the quantities under measurement can then be obtained manually through application of a known calibration to the recorded curves. But the process of analyzing the recorded data is time consuming. Whereas the required information may be recorded in an interval of a few minutes, days or even weeks may be required to translate the oscillograms into numerical data necessary for advancing the research in progress.

To reduce the time required for such operations an automatic data-reducing device has been developed by William F. Santelmann, Jr., a research assistant in the Institute's Laboratory of Electronics — operated jointly by the Department of Electrical Engineering and the Department of Physics. The device consists of a data scaler and printer. The data scaler receives a time-varying electrical signal whose voltage is proportioned to the quantity being measured. From the received signal, the data scaler then determines the numerical value of the measured quantity, accurate to within  $\pm 2$  parts out of a full-scale count of 999. The second unit, or printer, records the measured value of the quantity by printing three digits in Arabic numerals on moving paper tape at a rate of up to 100 values per second. Printing is accomplished without any delay for processing, as would be required in photographic recording, for example, and records are permanent.

The immediate availability of measured results, coupled with permanence and speed of printing, is accomplished by electrical rather than by photographic or mechanical recording. In the printing operation, use is made of Teledeltos paper, commonly used for facsimile reception. This paper has the property of changing its color at those points at which a sufficient voltage is applied between its surfaces; the change due to the application of the voltage taking place immediately and remaining permanent. With such recording paper, the desired records may be obtained by printing a group of dots so arranged as to form Arabic numerals.

Each digit is created on the electrically sensitized paper by an array of 15 dots, arranged in five rows of three columns each. Since three digits may be printed simultaneously, there are three electrode groups of three electrodes each arranged in a single row across the paper. Each electrode, under the control of the data scaler, prints dots in one column which are appropriate to the formation of the desired numeral. Since only one electrode is assigned for a column containing up to five dots, these dots must be printed sequentially, from top to bottom, as the paper moves beneath the electrode. The appearance of the resulting numerals is similar to the dot-formed numerals on electric scoreboards or news bulletin signs.

The printing process has no inherent limitation of printing time and, if necessary, printing could be in-



Irwin Falt

creased to a rate of several hundred characters per second. At present, three columns of five dots each are used for each numeral. If a display of about 35 dots were used (instead of 15, as at present), it would be possible to print all the characters of the typewriter keyboard. Therefore, an elaboration of the present printing system holds out the possibility of sending messages at a much greater speed than is now possible with the usual teletype equipment.

Aside from its use in telemetering, this device has application to many fields where electrical data are to be recorded, particularly at high rates. Since it is usually a comparatively simple matter to convert almost any physical quantity into an electrical voltage, the benefits of the data scaler and printer are not restricted to the measurement of electrical quantities. Conceivably, processes which now depend upon manual or mechanical data-handling could be speeded up by a large factor by application of the principles developed in this data scaler and printer.

## The Earth's Atmosphere

IMPROVED weather-predicting techniques are expected to result from research, now in progress, to study the complicated meteorological conditions which give rise to changes in the earth's atmospheric pressure. The success of weather forecasting is intimately related to knowledge of the changes in the earth's atmospheric pressure. For this reason, meteorologists are seeking an explanation for the mechanism of observed pressure changes.

In brief, the pressure at a point is the weight of the air column above that point, so that the pressure changes whenever there is a net change in the mass of air above the point where pressure is measured by a barometer. This change requires density changes in a vertical column of air, together with the motion of air



in or out of the column. The problem then involves variations in the fields of density and air motion.

It may seem surprising that the problem of the mechanism of pressure change still exists after about a century of weather forecasting. This state of affairs may be attributed mainly to the complexity of the problem as evidenced by the fact that the pressure change is always the small difference between the large contributions of different processes taking place at different levels in the atmosphere. The absence of information on the state of the atmosphere above the earth's surface has also been an important factor in limiting understanding of pressure changes. About 10 years ago, regular observation data on temperature, pressure, humidity, and wind above the earth's surface, taken twice daily over a vast area, became available for the first time. These observations made it possible for the meteorologist to test existing theories of atmospheric phenomena and to investigate the actual changes which take place in the temperature and wind field above the earth's surface.

As a result of a research project started in 1945, and directed primarily toward the analysis and synthesis of the empirical information on temperature, wind, and pressure, it appears that we now have a reasonably consistent picture of the changes in temperature and wind which accompany the pressure change at the earth's surface. The current program, under the direction of James M. Austin, '41, Associate Professor of Meteorology, and Professor Henry G. Houghton, '27, Head of the Department of Meteorology, and sponsored by the Office of Naval Research, is aimed toward an explanation of the process. It appears that the pressure change, which produces the motion of migratory cyclones and anticyclones, can be attributed to the circulation around the pressure system in a field of temperature contrast, in the lower part of the atmosphere. Current emphasis is being placed upon the more important meteorological problems in the pressure field.

Even though the analysis of meteorological data has played an important role in the research program, it must be emphasized that meteorological theory and physical reasoning have guided the program. Equations which relate temperature, wind, and pressure changes have been utilized to provide data on changing atmospheric patterns.

It is hoped that this research will lead to a better understanding of the pressure-change mechanism and, to improved techniques for predicting weather.

## **Dynamic Performance**

**S**AFE, relatively inexpensive, and rapid techniques for determining the dynamic performance of mechanical systems and components have been recently developed in the Instrumentation Laboratory of the Institute's Department of Aeronautical Engineering. The techniques, which overcome certain difficulties of other testing methods, were first applied to airplanes in flight. Exceedingly important in enabling the dynamic performance characteristics of airplanes to be obtained from measurements made in flight, the methods have been applied to the dynamic performance testing of other systems as well.

In one kind of test, using the frequency-response technique, the response of the airplane is determined from applied displacements of the elevator, rudder, and aileron. These control surfaces are oscillated sinusoidally, and from the linear and angular responses of the airplane, recorded on oscillograph paper, the amplitude and phase relationships between the input control displacement and the output linear and angular motions of the airplane can be determined. The results of such a frequency-response test were found to agree reasonably well with the performance predicted by theoretical methods. The frequency-response technique, using sinusoidal control displacements, required two hours' flying time for one condition of air speed, altitude, and center of gravity location.

Another technique, called the pulse method, considerably shortens the time required to make a test of dynamic performance. In this method, the pilot produces a sudden shock or jerk in the operation of the airplane which had previously been flying normally at equilibrium conditions. The transient condition, initiated by the pilot, is not sufficient to do damage to the airplane, but is sufficient to set up the fundamental motions which are characteristic of the airplane under test. By means of recording instruments placed on various portions of the airplane, the dynamic response of the airplane to such disturbances can be measured while the airplane is in flight, and the resulting displacements are recorded against time. Records of such measurements are analyzed in the laboratory after the test flight.

The performance function of the system under test — an airplane in the case under discussion — is the ratio of the output response (that is, the linear and angular motion of the airplane measured on an oscillograph) to the input response (that is, the disturbance inflicted on the system by the pilot in setting up a transient disturbance in the manner outlined above) and may be expressed in terms of amplitude and phase plots as a function of frequency. The pulse technique yields the performance function of the airplane over the useful frequency range from a single test. Recording of the test data involves only amplitude measurements with standard oscillographic instruments. The accuracy of the pulse technique is sufficient for all engineering requirements and results by this method are quickly obtained.

In general, the pulse technique for dynamic performance reduces test time, and increases the speed of extracting the performance function from the test data. In addition to determination of dynamic performance, the analytical section of the Instrumentation Laboratory, directed by Professor Charles S. Draper, '26, of the Department of Aeronautical Engineering, is continuing study in pulse techniques as a general method of analysis of linear and nonlinear systems.

The program of research reported here, to which Major Gerhardt C. Clementson, '48, United States Air Force, has made significant contribution, was part of the tracking control project directed by Robert C. Seamans, Jr., '42, Associate Professor of Aeronautical Engineering. The program was sponsored by the United States Air Force, which made available airplanes for the pulse and frequency-response tests.

## To Speed Model Flight Tests

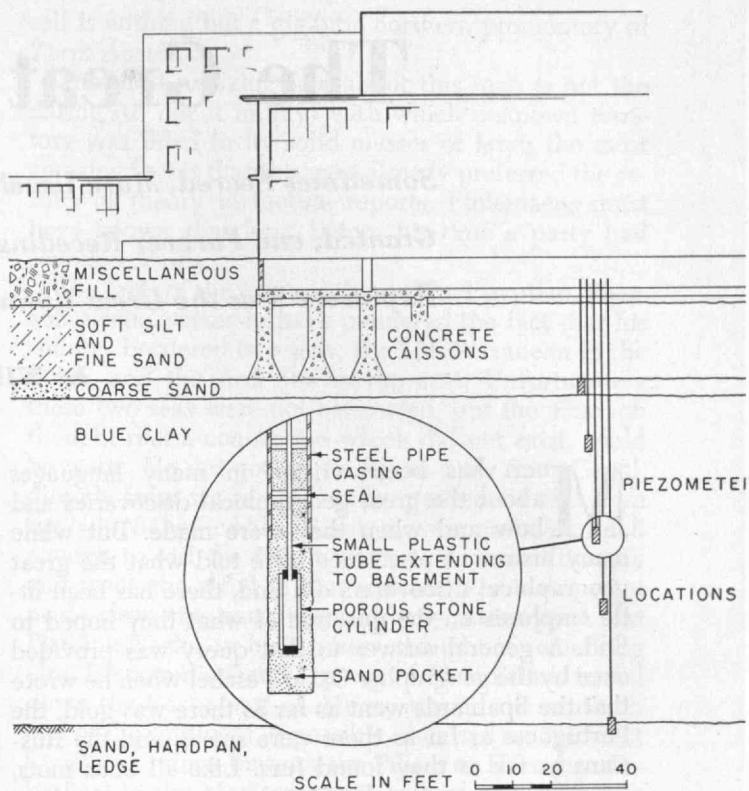
ONE of the greatest drawbacks in the use of dynamic models of aircraft has been the difficulty of quickly changing the basic mass and structural parameters of the model during the test program. Yet, such changes are necessary to arrive at the most desirable mass and elastic configuration. In the past, difficulties in making such changes have retarded the model program to such an extent that the aircraft, which the model is intended to represent, often reaches the flight stage before the model tests are completed. In such cases, the purpose of providing advance design data by means of models is defeated.

The technique of constructing and testing dynamic models which are similar to large aircraft has been developed to a high degree of precision at the Institute. The models, which are of such size as to be placed in existing wind tunnels, are constructed in such a manner as to reproduce, in detail, the elastic and inertial properties of the structure. Under the sponsorship of the Bureau of Aeronautics, Lawrence E. Beckley, '42, of the Division of Industrial Cooperation at M.I.T., has developed a sectional-type dynamic model which can be fabricated inexpensively and altered with little loss of time. By this scheme, a model wing can be constructed in several sections, each section of which has certain inertial and elastic properties. In addition, each section can be quickly removed and replaced by other sections with different properties. In this way, a complete structure composed of several components can be tested, and the influence of each component on the total behavior estimated. Such model versatility is especially useful in flutter studies, where a small change in the properties of a single component can have a profound effect on the flutter speed of the complete assembly.

## Sinking Foundations

THE Institute's Charles Hayden Memorial Library is serving as a laboratory for studies aimed to bring about a better understanding of the settlement characteristics of structures, and to check current theories regarding the settling of buildings.

An important phase of the foundation investigation for all large buildings is a prediction of settlement, which is based on the foundation soil characteristics and the building loads. Settlement observation points are all too infrequently placed in the building in order to check the prediction. At the time construction was started at the Charles Hayden Memorial Library, the opportunity for such a check was recognized by the staff of the soil mechanics section of the Department of Civil and Sanitary Engineering. Through the efforts of Donald W. Taylor, '34, Associate Professor of Soil Mechanics, and William H. Mueser, '22, of the firm Moran, Proctor, Freeman and Mueser, consulting engineers on the job, 32 settlement observation points were placed throughout the basement of the building. In addition, 10 water pressure measuring devices (piezometers) were installed, under the supervision of Harl P. Aldrich, Jr., '47, an instructor in the Department of Civil Engineering, in the 90-foot-thick layer of Boston blue clay which underlies the building. This



Piezometers at different depths in clay below Institute's Hayden Library check theories on settling of buildings. Water level in the piezometers returns to its initial level as the water is squeezed from the clay while the buildings are settling.

is the first installation of its type in a buried clay stratum below a building. The figure, just above, shows a cross section through the foundation of the Charles Hayden Memorial Library. The location of five, and details of one, of the piezometers are indicated in it.

The research in connection with this installation has as its object the correlation of theoretical concepts with observed data in order to bring about a better understanding of the settlement characteristics of buildings founded on compressible clay layers. According to a widely held theory, the water in the voids of the foundation clay initially carries the total weight of the building. The piezometers record this phenomenon by a rise in the level of the water in the plastic tube (see figure), indicating an increase in water pressure in the clay. This excess water pressure decreases rapidly at first as the water is squeezed from the clay allowing the building to settle. Eventually the entire weight of the building will be transferred from the water to the soil grains and the settlement will be nearly complete.

According to Mr. Aldrich, the Hayden Library has now settled about one inch in the north wing and about one-half inch beneath the central court area. This settlement is somewhat less than was predicted. By way of comparison, in the first one and one-half years after the main Institute buildings were constructed, a maximum settlement of about three inches was recorded at Building 10. To date, that building has settled over eight inches, while Buildings 1 and 3, which have considerably better foundation conditions, have settled from one to four inches.



# The Great Dream—I

*Sometimes Feared, More Usually Hoped for, Always Taken for  
Granted, and Forever Receding Beyond the Reach of  
Explorers Was the Great Unknown Southland*

By WILLY LEY

MUCH has been written in many languages about the great geographical discoveries and how and when they were made. But while many historians of science have told what the great geographical discoverers did find, there has been little emphasis on the question of what they hoped to find. A general answer to that query was provided once by the geographer Oskar Peschel when he wrote that the Spaniards went as far as there was gold, the Portuguese as far as there were spices, and the Russians as far as they found furs. Like all *bons mots*, Peschel's observation has its strong points as well as its weaknesses. The main strength of this particular characterization is that it holds true as far as it goes; its main weakness that it does not go far enough.

Not only did the Phoenicians and Egyptians, Greeks and Arabs, Irish and Vikings go exploring long before the Spaniards, Portuguese, and Russians had even become nations, but they also went exploring without such clear-cut economic aims. There were military situations to be explored, and claims for new lands to be settled; there were new nations with which to trade; and there were political journeys and missionary trips.

But through most of the history of exploration there is woven one continuous theme: the search for a gigantic continent, a continent which, it was thought, might easily be the largest of all. It was not only thought to be gigantic in size, but it also embodied all the hopes and all the wishes there were in existence. Men of letters of all nations thought about it and sang its praise. However, the long coast line of that continent on which to land was many a sailor's dream — always remained a dream. Whenever somebody thought that he had reached it, it dissolved like a vision, receded from the prow of the ship into uncharted distances and into the blue mist cloaking the horizon of faraway seas. The name that was later given to that fabulous continent was *Terra Australis Incognita*, the Unknown Southland. Its existence was sometimes feared, more usually hoped for, but always taken for granted.

The origin of the long-lived myth of that continent has been traced to two factors. One is very simply that our particular culture originated on the shores of the Mediterranean Sea and that that sea is landlocked. One might say that *Terra Australis* was a psychological recurrence of the northern shore of Africa. The second factor seems to have been a plain mistake.

At any event the story begins with the name of a great astronomer of classic antiquity, the Greek Hipparchus. Hipparchus knew that the earth was a sphere; in fact, he was the inventor of that net of degrees of latitude and longitude by which the location of a city or an island could be specified. Although Hipparchus was mainly an astronomer, he was a geographer, too. And he knew that the Mediterranean Sea and the Black Sea had no appreciable tides, while the Atlantic Ocean showed strong and regular tides. Then he heard that another astronomer, Seleukos, the Babylonian, had taught that the Indian Ocean was without tides. That statement was wrong, but Hipparchus could not know this. The obvious conclusion was that the Indian Ocean, too, was a landlocked sea. This being the case, it had to have a southern shore. The land was still unknown, but it had to be there. In fact there was a report around about just such a coast, of uncertain extent and position. It might be the North Cape of the unknown southern continent. Actually, that coast was a portion of the coast of Ceylon, but in about 150 B.C. it was not known with certainty that Ceylon, called Taprobane, was an island. At least, it was not known to Hipparchus.

The idea of a southern continent, of a repetition of the conditions around the Mediterranean, must have had a strong appeal, because it was well developed when the next important classical astronomer appeared, during the Second Century, almost precisely 300 years after Hipparchus. He was Ptolemy, or, as he should be called in order to avoid confusion with the Ptolemies of Egypt: Claudius Ptolemaeus. In many respects he was the direct successor of Hipparchus, continuing and rounding out his work in astronomical matters. In geographical matters he was the first man to produce a map of the world. His map dominated the conceptions of the classical world, and did so again after it had been republished in 1482 when new discoveries caused a great upsurge of interest in geographical knowledge.

On this map Africa and Asia dominate the scene and very little sea appears on it. The Atlantic Ocean appears as the western boundary of Africa from the Pillars of Hercules down to the equator, then Africa spreads westward to the rim of the map. In the north, that same Atlantic reaches around Europe, with England, Ireland, and Scandinavia drawn in as islands.

In the east, Asia fills the whole map; in fact, it is cut off by the map's border. It was anybody's guess



how far it extended in the east. The question of how far it extended to the north was left open, too. The southern end of Asia is, of course, India, somewhat incorrectly drawn. Taprobane now appears as an island, in the position of Ceylon, but much too large. Roman ships had sailed the Indian Ocean by then, and the coast of the Unknown Southland had receded for the first time.

But *Terra Australis Incognita* was there, making the Indian Ocean a second, though larger, Mediterranean. Asia, as has been said, was cut off by the border of the map, but close to the rim, the Indian Coast, — just east of something looking like the Malay Peninsula — made a sharp turn southward across the equator, to be met, say 20 degrees south of the equator, by the endless East-West Coast of *Terra Australis Incognita*.

*Terra Australis* began in the west at Africa's East Coast. That East Coast had been explored, say to the latitude of Zanzibar. There is actually a slight easterly projection of the African continent near Dar es Salaam, as can be seen on any modern map. In reality, the African Coast then turns south again; on Ptolemaeus' map it did not. It went on and on, in a magnificent sweeping arc which joined what we now call the Malay Archipelago. That, too, was thought to be solid land, naturally establishing an eastern boundary for the Indian Ocean and a connection with Asia.

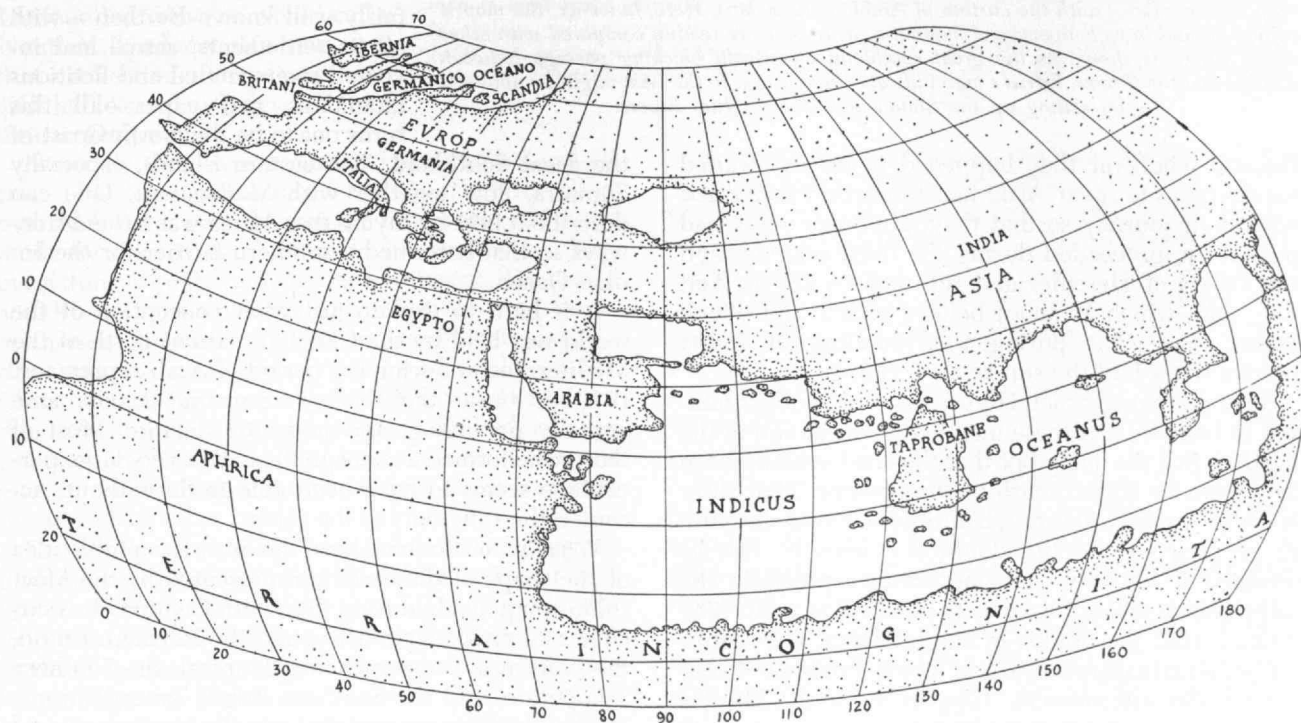
The map does not show it too clearly, but the Atlantic Ocean was taken to be definitely a northern sea. The whole concept is quite unmistakable: Africa it-

self is nothing but a gigantic northern promontory of *Terra Australis*.

The most amazing fact about this map is not the daring (to put it mildly) with which unknown territory was filled in by solid masses of land; the most amazing fact is that this map already preferred the results of theory to factual reports. Ptolemaeus must have known that long before his time a party had rounded Africa.

The facts of the case are these: The Egyptian, Pharaoh Necho, seems to have pondered the fact that his country bordered two seas: the Mediterranean in the north, and the Red Sea in the east. Unfortunately these two seas were not connected, but the Pharaoh thought that a connection which did not exist, could be made. He did not try to dig an early Suez Canal, directly from sea to sea, but he wanted a canal from the Nile to the Red Sea. His ships were probably small enough to sail the Nile upstream for some distance and reach the canal in that manner. For reasons not made clear, this work was suddenly interrupted. But Pharaoh Necho, or his advisers, thought of something else. He commissioned a group of Phoenicians to sail down the East Coast of Africa, around the southern end of the continent, if possible, then sail up the West Coast and return through the Pillars of Hercules (Gibraltar) to the Mediterranean, sailing east until they reached Egypt.

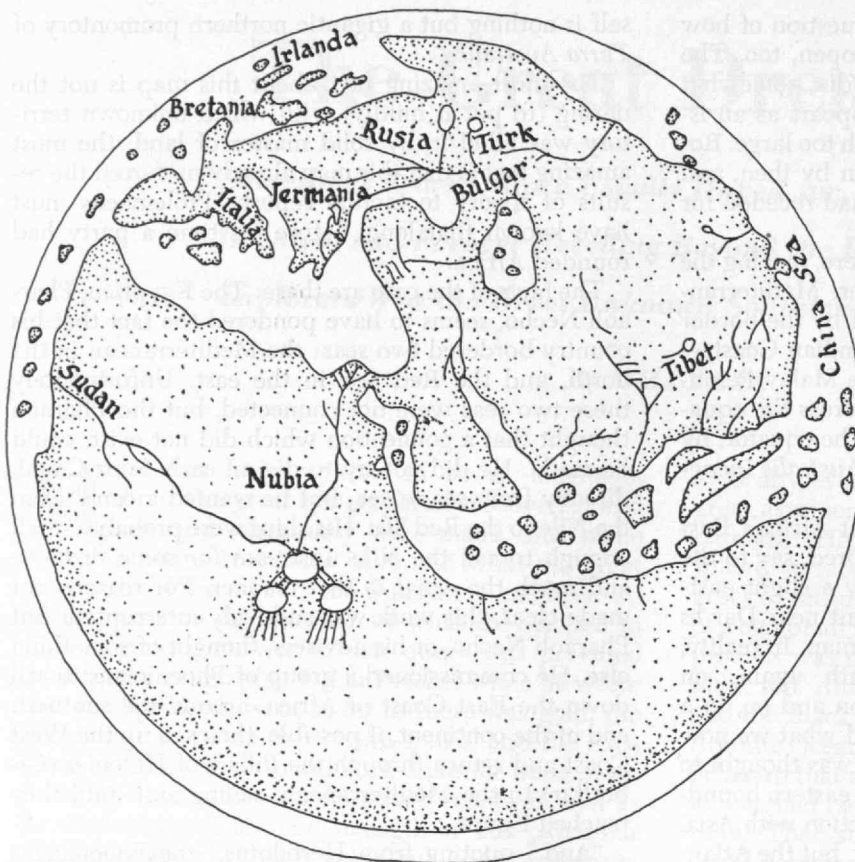
"And," quoting from Herodotus, "the Phoenicians set sail and sailed from the Indian Ocean into the Southern sea. When Fall came, they landed and tilled



Adapted from Fite and Freeman's *A Book of Old Maps*

Claudius Ptolemy, who lived in Alexandria during the Second Century, A.D., conceived the earth as a stationary sphere and proved the sphericity of the earth. As astronomer, mathematician, and geographer, his maps of the known portion of the world (along with two celebrated treatises, *Magale Syntaxis*, or, to use its Arabic title, *Almagest*, and *Geographiké Syntaxis*) were the standard works on geography throughout the Middle Ages; they were not supplanted until the Sixteenth Century. Ptolemy underestimated the size of the earth (using 180,000

stadia as the circumference instead of the more precise value of 252,000 stadia of Eratosthenes — one stade of Eratosthenes being 159 meters) but his maps are more accurate than many later ones. The Atlantic and Indian Oceans are landlocked, and only the known half of the world is shown. The southern portion shows the expansive *Terra Incognita* or *Terra Australis*. Ptolemy's division of the world by parallels and meridians is still adhered to in modern cartography. It is interesting to compare this map with those shown on other pages of this article.



Adapted from Encyclopedia Britannica, 14th edition

Edrisi's map of the world, dated 1154, is usually shown with north at the bottom of the map, in accordance with the custom of Arabic map makers. Here, however, the map is turned around in its conventional manner so as to be more readily compared with other maps. Africa is shown as the great southland effectively blocking passage between Europe and the Orient. Edrisi's map indicated that access to the East might be obtained by sailing up the Sudan and Nubia (Nile) Rivers.

the soil wherever they happened to be and waited for the crops to ripen. After harvesting they continued with their journey so that they, after two years had passed by, proceeded during the third year through the Pillars of Hercules and returned to Egypt. And they told, which I cannot believe myself, but which others may, that during the rounding of Lybia (Africa) they had the sun to their right."

That one thing which Herodotus could not get himself to believe, that these men had seen the sun in the north, is just the one proof that they had actually been in waters far to the south of the equator. That story was disregarded all through antiquity, mostly because its reporter, Herodotus, doubted it himself. But he doubted it for only that one reason — precisely the same reason which forces us to accept it as truth. The point is that the doubts of the historian, Herodotus, hinged on an astronomical fact which should have convinced the astronomers, Hipparchus and Claudius Ptolemaeus, as it convinces us.

But both rejected this report of a trip around Africa, made during the years 596-594 B.C., almost precisely 2,000 years before the trip which is quoted in standard geographies as the first journey of that kind. Both also rejected the statement of an old *periplus* (sailing direction) that the Indian Ocean and the Atlantic Ocean meet south of Africa. They may have thought that this statement was based on the report of the trip

undertaken by order of Pharaoh Necho — as may have been the case.

During the Roman Era the great geographical problem seems to have been simply dormant. Rome owned the Mediterranean, Rome dominated most of Europe, Rome had trade relations with the Far East. And Rome was essentially a land power; seas, to the Roman mind, seem to have been obstacles rather than trade routes.

Then the political picture changed and for a time the Arabs were the most important power on the Mediterranean. Their outstanding geographer, 1,000 years after Claudius Ptolemaeus, was El-Scherif Abú Abdallah Muhámed ben Edrisi. Of course he knew the map of Ptolemaeus and he had no reason to doubt it, except for minor details. Edrisi's map of the world was essentially an improved version of the older attempt. On Ptolemaeus' map, Africa's East Coast turned east at about the latitude of Zanzibar. On Edrisi's map, it does the same — a few dozen miles south of Aden. The whole East African Coast, fairly well known by then — with all its settlements, actual and invented rivers, actual and fictitious mountains and capes — all this turns out to be the North Coast of

the great Southland. The eastern islands, especially Sumatra, flow together with Madagascar. One can describe it best by saying that Africa was turned sideways so that it formed a southern barrier for the Indian Ocean.

It is hard to explain just what conception of the world was held by the Christian nations north of the Mediterranean during the period of Arab supremacy. It is best to say that there were several beliefs, none actually prevailing, and none too definite. Most of those who formed a conception at all (a very large percentage seems to have been able to do without) accepted the sphericity of the earth.

What seems to have been the most acceptable idea of the shape of the earth is represented by the Macrobios map, made during the Tenth Century. It is circular and divided into five zones: the Northern Frigid, the Northern Temperate, the Tropical, the Southern Temperate, and the Southern Frigid Zones. Europe, Asia, and Africa are crowded into the Northern Frigid and Temperate Zones; only some southern parts of Africa and Asia project into the Tropical Zone. Most of the Tropical Zone was taken up by a wide sea, while everything else — the whole available space of the Southern Temperate and Frigid Zones — was occupied by the southern continent. *Temperata antipodum* says the map, adding cautiously *nobis incognita* (unknown to us).



Then, several important events took place. One was the introduction of the magnetic compass, shortly after 1100 A.D. We can be fairly certain now that it was invented in the North, somewhere along the shores of the North Sea. Suspicion naturally centers on the Vikings who were not only a seafaring nation, but who also lived in a country rich in iron ores, among them lodestones, natural magnets. The crusades were another important event. They did not add any new geographical knowledge, but they did stimulate interest in geography.

The third event was the return of the Polos from the Far East. That there were large and rich countries far to the east was not precisely new knowledge either, but Marco Polo's stories stirred the imagination, although contemporaries thought he exaggerated.

Just about a century after the return of the Polos, Prince Enrique of Portugal was born. History calls him Henry the Navigator, although he never made any long voyage himself, and very few short ones. But he caused others to do so. He founded what we would call a Nautical Academy. He saw to it that a collection of maps was made and that learned men devoted their time to geography.

Naturally there was a practical purpose behind all this. The Polos had reached the Far East traveling overland. But a great deal of the return trip had been made by ship. If the East could be reached by ship, everything would suddenly look different. The trade could be carried on directly, without cheating intermediaries. Ship-borne goods would be far cheaper than goods carried by caravans. And finally, if the Christian nations, especially Portugal, could entrench themselves in the East they might, in the end, be able to attack the Mohammedans from the rear. The main question was whether the whole trip could be made by ship.

Essentially the choice was between the map of Ptolemaeus-Edrisi and the Macrobius map, or one like it. If Ptolemaeus-Edrisi were right, it could not be done. In order to sail on a landlocked sea one had to reach its shore first by overland travel. Here, unfortunately, the Mohammedans were in the way. If Macrobius was right, the problem was different. The *Terra Australis*, which prevented reaching the East by ship on Edrisi's map, existed, but it was a far southern continent with a wide tropical sea in between. All one had to do was to go south along the African shore until that tropical sea was reached, sail the length of that tropical sea, and arrive in the Indian Ocean.

The next problem was whether one could sail through that tropical sea. The older scholars said "no"



Adapted from Wroth's Early Cartography of the Pacific

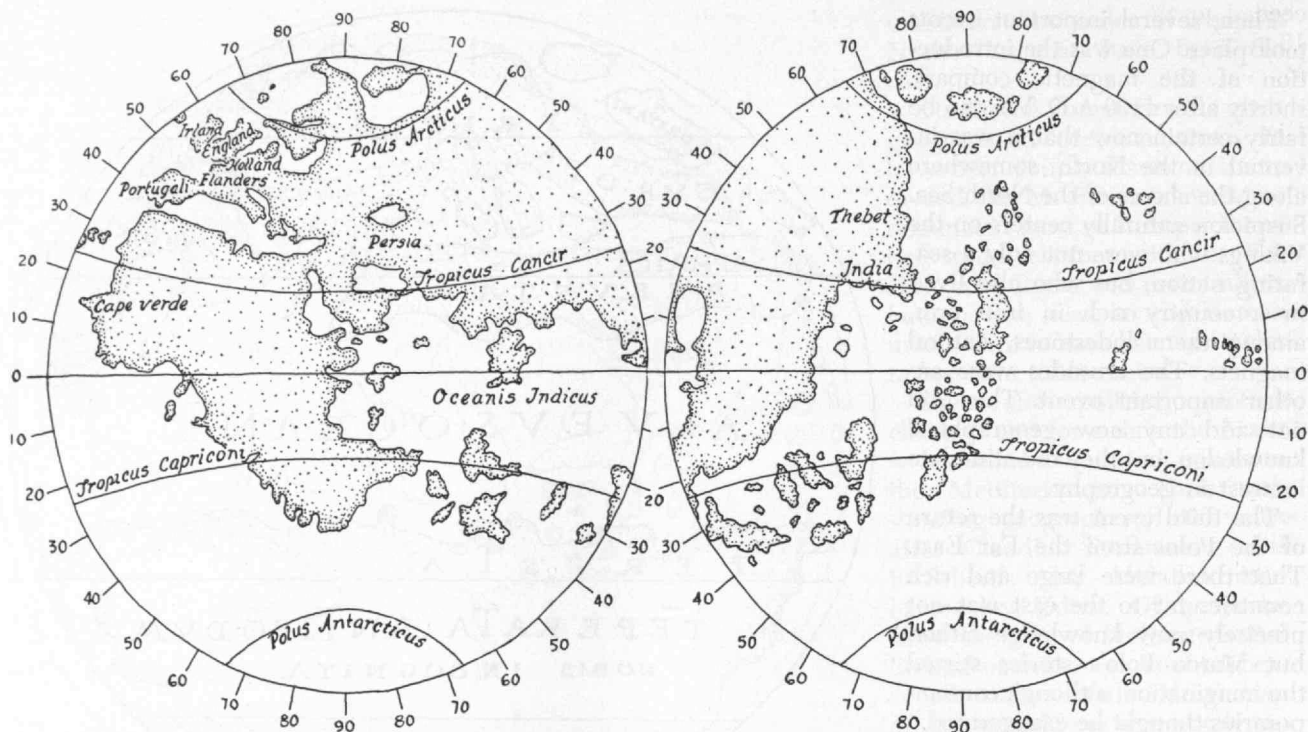
The Macrobius map showing the land of the antipodes. This Tenth Century circular map is built upon exposition of the Sixth-Century geographer, Aurelius Theodosius Macrobius, whose work, *In Somnium Scipionis expositio* was first printed in the year 1483. The known world is divided into five zones, with clear indications of a southern unknown habitable region which is separated from the countries of Europe, Africa, and India by a large ocean.

with emphasis. Aristotle had said that the heat of the Tropical Zone must condense the water into a jelly-like substance, and that no ship could pass the *Mare pigrum*. The heat of the sun in these latitudes would be so terrible that it would ignite the wooden ships, after having struck dead their captains and crews. Nobody could live in these zones — which was the reason why the continent of the antipodes was marked *nobis incognita*. It was not only unknown to us, but it would not ever be known, since there was no way of passing the Torrid Zone.

It was a dilemma of the first order and the problem might have been dropped then and there if Edrisi's map had not provided another possibility. Edrisi had done something strange to the Nile. It did empty into the Mediterranean, as was well known, but farther upstream, in Nubia, the Nile divided and sent one long arm all the way across Africa to the Atlantic. That arm was the Gold River. This idea of Edrisi helped no end in Portuguese planning.

If one sailed straight south from Portugal one would, of course, reach Africa. Then one would follow the African Coast until the mouth of the alleged Gold River was reached, and then one could sail upstream across Africa. That still would not get the ships into the Indian Ocean, but the Mohammedans would be by-passed along a southern route and the ships would arrive in the fabulous kingdom of Prester John (then





Adapted from Nordenskiöld's Facsimilie Atlas

Martin Behaim's globe of 1492 records knowledge of the world just prior to the discoveries of Columbus and other Fifteenth-Century navigators. The absence of the continents of North and

thought to be Abyssinia). Prester John's kingdom bordered the Indian Ocean on the other side, and since it was a Christian kingdom the Christian Portuguese would have all the assistance they needed to finish the trip across Africa overland and build their ships on the Indian Ocean.

Fortified by this idea, the Portuguese started exploring. In 1419 they discovered (or probably rediscovered) Madeira; 15 years later they found the Canaries. The climate grew warm, even hot, but the luxuriant vegetation was reassuring. Maybe it would not be as bad as some philosophers had claimed. And while the water grew warm it did not show any noticeable "jellying." It was possible to go on, with the greatest of care, of course.

And they had reasons to be extra careful. In spite of their new instruments, including the magnetic compass, the sailors were in the habit of hugging the coast as much as possible. They felt safer within the sight of land. Doing just that was dangerous off the African coasts where shifting sandbanks suddenly appear and disappear again, where there are hidden cliffs, where coastal currents are often powerful, and where sandstorms from the interior reduce visibility to a matter of feet.

In 1441 Nuño Tristão reached Cabo Blanco (Port Étienne) at 21 degrees north. As the name indicates, it consists of white sands and is without vegetation. This looked ominous. Did the Torrid Zone, where no plants could exist, begin at this point? To their great relief the sailors saw people ashore; if people could live there it could not be too bad. But it is typical that Diniz Diaz who reached Africa's westernmost point four years later christened it Cabo Verde, the Green Cape, to reassure others by the very name of it that

South America is conspicuous, and the Pacific Ocean is reduced in size. This supposed state of affairs encouraged explorers to reach Asia by sailing directly west from European ports.

there was still vegetation. In 1447 they reached Sierra Leone — before the Portuguese, the Carthaginians had been there some 2,000 years, and Pharaoh Necho's hired Phoenicians may have landed there even earlier.

Prince Enrique, just before he died, in 1460, was rewarded by the report of one Diogo Gomez that a big river did come from the interior of Africa, the Niger.

After Prince Enrique's death there came a pause, well justified by political events. But Enrique's successor did not give up completely. He eliminated personal worry about the continuation of exploration and simultaneously increased the country's revenue by making an arrangement with the rich merchant Fernão Gomez which stipulated the following: Gomez had to pay a certain sum to the treasury and had to oblige himself to push exploration of the African Coast by 100 *leguas* (335 miles) every year in return for which he was granted trade monopoly along the Guinea Coast.

One year after this agreement was made, Gomez' captains passed the equator. One year after that, Fernão (Fernando) Po landed on the island which still bears his name. But then things slowed down some more. The Guinea Coast offered the same dangers to coast-hugging vessels as had been experienced earlier, even to a higher degree.

Still, after things had progressed to such an extent, anything that could happen would only cause a delay; cessation no longer threatened seriously. In 1485 a ship commanded by Diogo Cão (Cam) discovered the mouth of the Congo. Aboard was a young man from Nuremberg, who was to become one of Portugal's foremost geographers: Martin Behaim. They sailed upstream for some distance, wondering whether this was Edrisi's Gold River, but then turned back and pro-

ceeded southward along the coast, reaching a point 16 degrees south of the equator, near the present Mossamedes.

The Torrid Zone could be passed and Bartolomeu Diaz was sent out to find out how far Africa extended to the south. He landed near the present Swakopmund, then pressed on. The coast again showed a tendency to turn in an easterly direction, but Diaz could not follow it as closely as he wanted to, because a sudden storm blew his ships past the southern cape which Diaz called *Cabo Tormentoso*, the "Cape of Storms." He did not go on. His men threatened mutiny, and the captain himself was frightened. He returned to Portugal in 1487, announcing that Africa did have a southern end, the Cape of Storms, where he had feared to be wrecked.

In Portugal they thought differently about this report, not having undergone Diaz' experiences. Africa did have a southern end; that was one important piece of good news. The projection westward did not exist; even if there was a *Terra Australis* it might be possible to find a canal through it into the Indian Ocean. Martin Behaim made a globe on which things were shown just this way. Africa did have a long projection eastward from its southern end, but it failed to land-lock the Indian Ocean completely. One could thread one's way in, between the African land and the large East Indian (Malayan) Islands. If things were like that, then everything was fine. The southern end of Africa was much farther away than had been hoped, but at least it existed, and the tropical seas could be sailed. There was good hope that India could still be reached.

Consequently Diaz' name of Cape of Storms was rejected and Cape of Good Hope substituted. That it was not actually Africa's southernmost point (that is, Cape Agulhas, east of the Cape of Good Hope) was only of academic interest. Ten years after Diaz' return, Vasco da Gama rounded Africa and finally arrived in India.

Ptolemaeus' *Terra Australis* had been expelled from the map. Or so one should think. True, Martin Behaim's eastern projection of Africa had to be erased from the map too, since Vasco da Gama had sailed through it. But all this did not mean that *Terra Australis* did not exist. It merely meant that Ptolemaeus had erred in thinking that Africa was part of *Terra Australis*. If somebody sailed southward from the Cape of Good Hope one would find it. Sailors had just stuck to the coast line too closely as they always did.

Nobody went searching at once. Portugal was, after all, interested in business relations and that meant India. At the moment it was far more important to consolidate the spice business than it was to

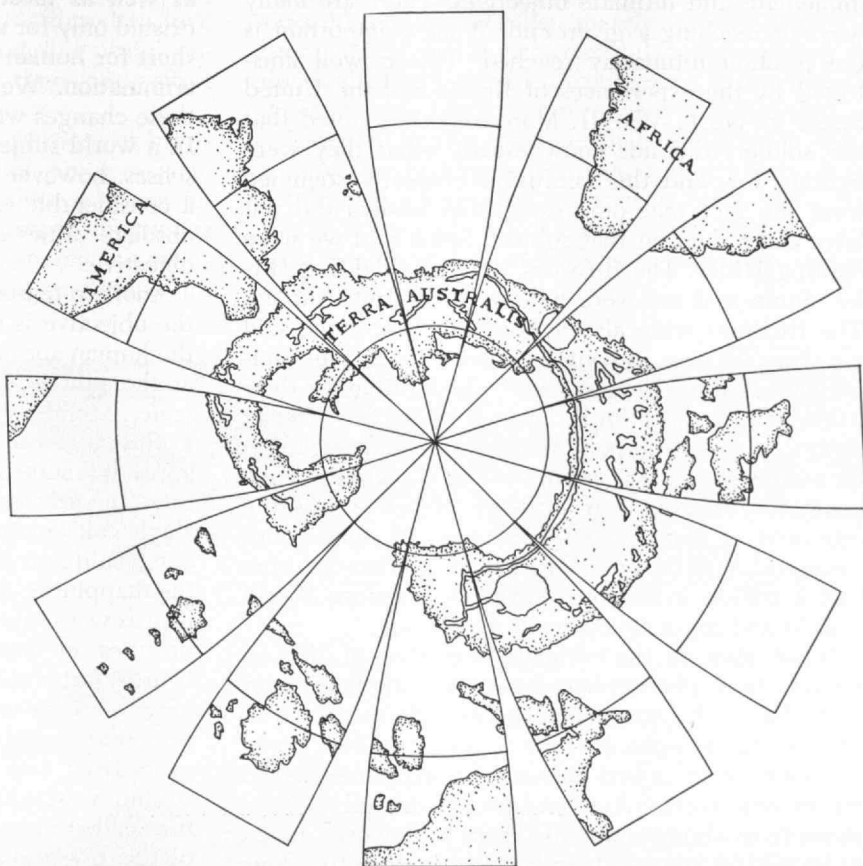
chase *Terra Australis* which would not run away. The pleasure was spoiled mostly by the fact that one had rejected the pleas of a certain Italian, one Cristoforo Colombo "whom nobody knew." That Italian had gone to the king of Spain, and Spain, being envious (and with good reasons) had finally provided funds and three old caravels. Columbus reached what he thought to be Asia from the other side.

The Spaniards were elated. Those long trips around Africa were not needed; a three-weeks' sail to the west would suffice. That Colón, or Columbus, had first landed in an area which was not known was understandable. Obviously there were many more islands off Asia's eastern coast than overland travelers had been told about.

Five years after Columbus, Giovanni Caboto — by then anglicized as John Cabot — reached the "mainland of Asia" much farther north. Some geographers began to suspect a new continent, and then came a report that (three years after Cabot) Captain Pedro Alvares de Cabral had found still another shore. He had left with 13 ships to follow da Gama's route, had held off Africa too much and reached a different land: Brazil.

Cabral's accidental discovery caused speculation by the volume. He might have reached *Terra Australis* although he himself thought it was just a very large island. Of course there might be a group of very large islands there, a kind of counterpart to Java, Sumatra, and so on. Or, needless to say, it might be a continent,

(Continued on page 324)



Adapted from Nordenskiöld's Facsimilie Atlas  
Southern Hemisphere of Schöner's globe of 1515 shows a large southland with bays, rivers, and lakes separated from Africa and South America by sizable stretches of water. For the most part, the region of *Terra Australis* lies just outside the Arctic Circle and forms almost a closed ring around the Antarctic Ocean.

# The Ultimate Objective of Life

*Perpetual Advance Is Most Rapid under Conditions Which*

*Provide Maximum Individual Liberty and the Greatest*

*Probability That Correct Decisions Will Be Found*

By H. B. PHILLIPS

SOMETIMES we speak of one form of government or morals as higher, another form as lower. To give meaning to such expressions we must know the purpose of life. The system which more nearly accomplishes that purpose is the higher. What then is the objective of life, the achievement of which is to measure the success of any system of morals or of government?

This question is fundamental. There are people, for example, who sacrifice their lives for a system of government called communism: others sacrifice themselves just as freely for what is called democracy. When representatives of the two groups are brought together they cannot settle their differences by argument since they do not agree on the objective to be accomplished by government.

In considering such matters, we must distinguish immediate and ultimate objectives. There are many ways of reaching a given end. What is important is the position ultimately reached. This is well illustrated by the experiences of Russia and the United States in World War II. Many reporters noted that our soldiers did not know exactly what they were fighting for, and this confusion evidently stemmed from the fact that our responsible leaders did not have clear ideas on that subject. Some said we were fighting Hitler. The Russians were also fighting Hitler. Some said we were fighting to destroy Nazism. The Russians were also fighting Nazism. Some said we were fighting for our lives. In a much more imminent sense the Russians were also fighting for their lives. As General John R. Deane's book, *The Strange Alliance*,\* so clearly points out, the Russians regarded these, however, only as immediate objectives. They never forgot that their ultimate objective was the extension of their form of communism throughout the world. It is thus not surprising that there are now half a billion more communists than before World War II and fewer followers of democracy.

What then is the ultimate objective of life on earth? Many philosophers have thought the answer to be human happiness, or, as Beccaria expressed it, "the greatest happiness of the greatest number." Some religions have looked askance at happiness as an ethical objective, and in fact have considered physical pleasure as almost immoral. There is, however, much to be said in favor of happiness as an objective. Our senses of pleasure and pain have been developed in the long slow process of evolution. Those who enjoyed things that were beneficial found life easier.

\* New York: The Viking Press, 1947. \$3.75.

Those whose pleasures were harmful had greater difficulty. After ages, during which the race was barely able to survive, only those were left whose senses were best adapted to the conditions under which they lived. Thus, our sense of happiness is the best that nature could make it. Still there are fundamental reasons why human happiness should not be the ultimate objective of man.

A first reason stems from the origin of this sense through the process of evolution. This process adapts only to conditions which have existed for a long time and makes no provision for change of conditions. In some parts of the world, for example, the cattle forage includes poisonous plants. The local cattle have acquired a distaste for these plants and are uninjured. Cattle brought in from other countries eat these plants and die. Many of the conditions most helpful, as well as most harmful, to the human race have existed only for a few generations, a period much too short for human tastes to develop any powers of discrimination. We have every reason to believe that these changes will be much more rapid in the future. In a world subject to such perpetual change, human senses, however elevated, will always be obsolete to a considerable extent. A state of happiness based on obsolete values cannot furnish a satisfactory ultimate objective.

Another reason for rejecting human happiness as the objective is that it gives too great importance to the human species. Man is merely the creature which at the present moment is at the top of the animal scale. Morals should not depend on the stage of evolution. To see the absurdity of this, we need only apply this same criterion at an earlier period. At one time the highest form of life was represented by single-cell creatures of the type of the Protozoa: no one would now take the ultimate objective of life to be the happiness of Protozoa. A little later the giant lizards were supreme: no one would now consider the beauties of nature created for the enjoyment of lizards. Later still, mammals appeared about the size of rats: no one would now base a moral system on the promotion of the welfare of rats. And millions of years from now some superscientist, digging in the rubble of Manhattan for relics of a prehistoric creature called man, will certainly not think the marvels of this physical universe were provided for the happiness of such an animal as that.

Thus, however high we place the goal of life, it will ultimately be reached and passed. The highest forms in every age will already have attained a level



beyond the wildest dreams of every preceding age. The only way to assign a permanent goal is to say that the purpose of life is just to keep advancing forever and ever.

This advance is progress, and since it produces things which never existed before, it is creation. According to this view, creation is not something which was accomplished billions of years ago but a process now going on, and which will always continue to go on. This external process of creation is what life is and what life is for.

This process has now, however, reached a critical stage. During all past ages development has occurred under conditions over which the living things had no control. Through increase in intelligence man is now reaching the point at which he can consciously influence progress. For the first time, good and evil have thus appeared in the world. An action which aids the long-term trend of progress is moral, or good. An action which opposes that long-term trend is immoral, or bad.

Here we have the real reason for those fundamental rules of conduct common to all the great moral codes. The purpose of these rules is efficiency. In all ages progress, so far as human beings can influence it, has come from the surplus of time and energy over that required to produce the necessities of life. Unnecessary killing is forbidden because it reduces the number of workers available to produce that surplus. Stealing is forbidden because it transfers resources from more productive to less productive control. Lying is forbidden because correct decisions require correct information. Individuals are adjured to love and not to hate because love promotes useful co-operation, whereas hate wastes time and effort through useless opposition.

Assuming then that the ultimate purpose of life is perpetual advance, the fundamental problem is to determine which way is forward. Since advance involves entry into the unknown, the proper direction is not suggested by experience. Also, reason is powerless, since reason does not suggest anything, but

merely indicates whether a given suggestion is in accord with experience.

To handle this condition two methods have been tried. One is to adopt a single course of action determined by a dictator, by a majority, or by mere custom. Since the number of wrong courses vastly exceeds the number of right, this single choice is almost certain to be wrong. The other method is to provide diverse courses of action by leaving the choice to the smallest political units, and whenever possible letting each individual follow his own course. This results in a larger number of methods being tried with a proportionately larger probability that one will be correct. The greater success of the right method ultimately leads to its adoption. This is the only valid reason for liberty.

Unfortunately, individual liberty has nearly always been presented as merely a sentimental right, and all over the world there are simple-minded people who think it is not right to be wrong. If the way to heaven is known, they do not think it right to let people go to hell, and consequently do not believe in religious liberty. If correct information is available, they do not think it right that the public should be misled through incorrect information, and consequently they do not support freedom of speech or freedom of the press. If correct economic and business methods are known, they do not think it right that the public welfare should suffer through inferior methods, and consequently do not believe in freedom of enterprise. These simple-minded people are entirely correct. If right methods are known, they should be enforced, since liberty consists then merely in the privilege of being wrong. But if right methods are not known, individual liberty should prevail, since it provides the greatest probability that somebody will be right.

Thus we finally conclude that the ultimate objective of life is perpetual advance, that liberty is the condition under which advance is most rapid, and that in human affairs it is therefore the principal business of all social organizations to provide maximum individual liberty.

*H. Armstrong Roberts*





M.I.T. Photo

*The proximity of Institute buildings and sailing facilities offers respite between classes.*



# Sailing at M.I.T.

*For the Decade and One-Half for Which Its Dinghy Fleet*

*Has Sailed the Charles River, Intercollegiate Competition,*

*Trophies, and Nautical Recreation Have Come to Technology*

By WALTER C. WOOD

WHEN the sailing program was inaugurated at M.I.T. in the spring of 1936, the primary motivation was the desire to increase outdoor recreational activities for students at the Institute. The 15 years of growth of the M.I.T. Nautical Association demonstrate that this aim has been accomplished to a degree far in excess of that originally contemplated, and that many additional advantages have come to the Technology campus as a result of the happy introduction of a fleet of boats and a Sailing Pavilion on the Charles River.

First and most important of the subsidiary developments is the stimulation which has been given to collegiate sailing. The Technology program has been the model and inspiration for more than 100 college sailing clubs which now stretch from coast to coast, and extend even into Canada. These clubs are members of an over-all governing association called the Inter-Collegiate Yacht Racing Association of North America which is divided into four geographical districts: New England, Mid-Atlantic, Midwest, and Pacific Coast. These districts schedule their own regional races, arrange occasional intersectional regattas, and hold a national championship on a rotational basis in one of the districts each year. This spring, from June 19 to June 22, the New England district will conduct the National Dinghy Championship, with the M.I.T. Nautical Association serving as host club. The Pacific

Coast teams of the University of California and Stanford University, with the University of Arizona as alternate, have already been selected to take part in this event on the Charles River. The other districts will choose their teams as a result of their spring regattas.

When it was introduced at M.I.T. in 1936, sailing had not been planned as a competitive sport. For many years, however, a spring race in boats larger than dinghies had formed the basis for a college sailing championship. It was only natural that colleges that had taken part in such races should seek to include M.I.T. in their competition as soon as dinghy sailing had been introduced at Technology. An invitation to take part was accepted and the M.I.T. team won by a small margin that first year; Technology's dinghy sailing has continued to dominate the field up to the present time. Out of 150 major regattas, which usually contained entries from 10 to 12 colleges, the M.I.T. teams have won 72 regattas; Brown University won 19; Harvard University, 18; Coast Guard Academy, 17; and Yale University, 16. The engineers have won six National Championships, while Yale has won three, Brown and Princeton, two each, and the Coast Guard Academy, one. This past year, the Technology team won nine of the 12 large events in which it was entered. Only the McMillan Trophy, won by Brown University and sailed in the U. S. Naval Academy's

*Symbolizing victory five times in the fall of 1950, M.I.T. dinghy sailors have been privileged to add the trophies shown in the photograph at the right to their impressive collection. As a result of various championship races held in the autumn, the Institute is the proud possessor of: the Danmark Trophy shown in the left foreground; the winning trophy for the Erwin H. Schell Regatta (center foreground); and the Oberg Trophy which appears at the right in the foreground. The two plaques shown in the background are the James Pine Trophy at the left, and the Leonard Fowle Trophy at the right.*







*Pictured at the left are five trophies won by members of the Institute's Nautical Association during the spring of 1950. Glancing from left to right, in front, are: the Boston Dinghy Club Cup, the United States Coast Guard Alumni Bowl, and the Oberg Trophy. In the background, at left, is the Lucien Sharpe Trophy of Brown University, and to its right, the George Owen Trophy. Winning the Greater Boston Championship in the fall of 1950, as well as last spring, the Oberg Trophy continues to grace the M.I.T. Sailing Pavilion.*

40-foot yawls, the National Championship for the Morss Bowl, won in California by Yale University, and the Jack Wood Trophy, taken by Harvard University, failed to find a haven on the Sailing Pavilion's trophy shelves. This continual domination of sailing among the colleges of the East has had a beneficial and exhilarating effect upon all sports at M.I.T.

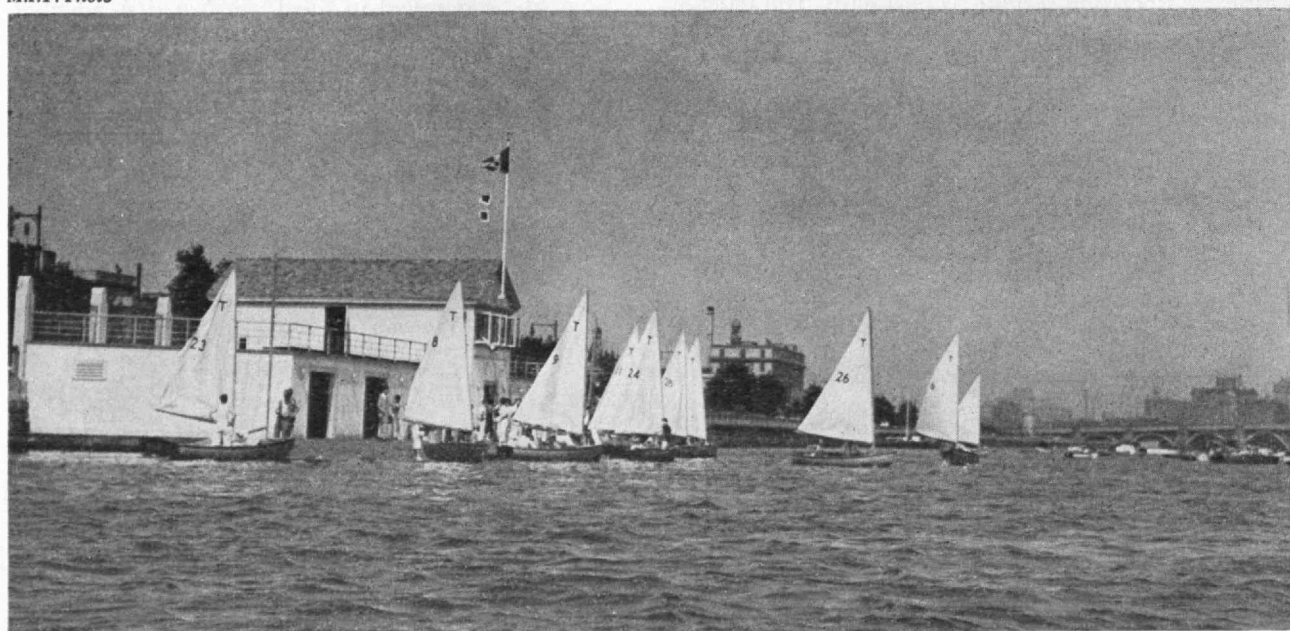
Sailing purely for recreation continues to constitute, by far, the largest function of the M.I.T. Nautical Association. The yearly membership averages 1,000 — of which 900 are students, and 100 are from the instructing staff or employees of the Institute. Annually, the membership averages between 14,000 and 15,000 man-hours of sailing, and, since the start of the program, more than 200,000 man-hours of recreational and competitive sailing have been recorded. More than 7,000 individuals have been members of the Nautical Association and comprise the alumni of the Institute's sailing program. Approximately 6,000 of these people learned their sailing at Technology, and many have continued to make it their favorite recreation after graduation, if they have been fortunate enough to live near water facilities.

The Institute's sailing program is greatly aided by having excellent sailing facilities literally at the doorstep of M.I.T. Because of the proximity of classroom

and Charles River Basin, it is easily possible for a student to enjoy a sail during a single free hour between classes. Boats are deftly launched, are rigged in a matter of five minutes, and, once rigged, they are left available at the dock for the inevitable crowd which gathers for sailing at the closing hours of the day. The required freshman sports program (which schedules hours of swimming, sailing, golf, tennis, volleyball, squash, badminton, and softball throughout the day) has helped the freshman to quickly become skilled in sailing techniques. The classes of approximately 40 are easier to work with than the larger groups, and sailing is much more enjoyable in the warm, sunny hours of midday than the cold, dark, windless hours of early evening. The sight of the Charles River Basin dotted with sails throughout the day has done much to dispel the fallacy that Technology students do not have time for play.

Sailing has given the Technology students valuable contacts with men in neighboring schools and yacht clubs. The teams of Boston College, Boston University, Northeastern University, and Harvard University use the M.I.T. sailing facilities at hours which do not conflict with Technology's use of the boats. The Harvard Naval Reserve Officers' Training Corps  
(Continued on page 321)

*M.I.T. Photo*



# THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

## New Dean Appointed

THE appointment of E. Francis Bowditch, headmaster of Lake Forest (Illinois) Academy, as dean of students at the Institute has been announced by James R. Killian, Jr., '26, President. Mr. Bowditch succeeds the late Everett Moore Baker, who died in an aircraft accident last August. In announcing Mr. Bowditch's appointment, Dr. Killian made the following remarks:

The dean of students at M.I.T. has authority and responsibility for overseeing all aspects of student welfare and for the Institute's relationships with student government and recognized activities, including athletics and fraternities. By advising and counseling with individual students and with student groups, he is in a position to promote fine morale, high standards of conduct, and the best possible conditions for personal development and educational achievement.

Mr. Bowditch was invited to fill this important post after a country-wide search. He brings to the office broad experience in the field of education and administration and great skill in working with young men.

Since Dean Baker's death, Dr. Dana L. Farnsworth, Medical Director of the Institute, has directed the ac-

tivities of the Dean's Office. Mr. Bowditch's appointment becomes effective next July.

Mr. Bowditch, who is 38 years old, was born in Framingham, Mass., and is the son of John P. and Alice B. Bowditch. He was educated at Milton Academy from which he was graduated *cum laude* in 1931 with a prize scholarship to enter Harvard. During his undergraduate career there he was president of the student council and served as second marshal of his class which was graduated in 1935. During his freshman and sophomore years he was a member of the track team. He is a member of the AD Club and the Hasty Pudding Club.

During his junior and senior years at Harvard, Mr. Bowditch taught at the Shady Hill School, and upon his graduation returned to Milton Academy where he taught Latin and English, and coached in football from 1935-1937. He left Milton to accept the appointment of assistant dean of freshmen at Harvard College and served in that position from 1937-1939 when he was appointed headmaster of the Park School in Indianapolis. He went to his present post as headmaster of Lake Forest Academy in 1941.

Mr. Bowditch has been a member of the Headmasters Association since 1942, and served two terms as president of the Midwest Preparatory Conference from 1943 to 1945. He was president of the Private Schools Association of the Central States from 1948-1949, and has been chairman of the National Council of Independent Schools and the National Preparatory School Committee.

## Sheehan to Receive Chemical Award

JOHN C. SHEEHAN, Associate Professor of Chemistry at the Institute, who has made valuable contributions to fields as diverse as high explosives and life-saving drugs, will receive the \$1,000 American Chemical Society Award in Pure Chemistry on April 2, during the Boston session of the Society's 119th national meeting, according to an announcement by N. Howell Furman, President of the Society and Head of the Chemistry Department at Princeton University.

Dr. Sheehan is best known for his share in developing the Bachmann process for preparing the high explosive RDX, and for his vital part in the research leading to the synthesis of penicillin. He will receive the award at a general assembly of the Society in the Hotel Statler. His award address will be presented on April 4 before the Society's Division of Organic Chemistry. Professor Sheehan's topic will be "The Synthesis of Substituted Penicillins and Simpler Structural Analogs." The American Chemical Society Award in Pure Chemistry is presented annually to recognize and encourage fundamental research carried out in North America by young men and women. It is financed by the professional chemical fraternity, Alpha Chi Sigma.



E. Francis Bowditch

Dean of Students at M.I.T.



## Class Reunions

As copy for the April issue is in preparation, word comes to The Review Office of June class-reunion plans. The majority of the class programs fall on dates just preceding or following Alumni Day on Monday, June 11. The Review is happy to list below information assembled to date on class get-togethers. Later details on class reunions may be obtained directly from the class secretaries.

- 1891 June 9. Dinner around noontime at The Country Club, Brookline, Mass.; Harry H. Young, reunion chairman, J. L. Hammett Company, 290 Main Street, Cambridge 42.
- 1896 June 8 and 9. New Ocean House, Swampscott, Mass. Dr. John A. Rockwell, reunion chairman, 24 Garden Street, Cambridge 38.
- 1901 50th reunion. June 8, participation in commencement activities; June 9 and 10, Oyster Harbors Club, Osterville, Mass.; June 11, special class table at Alumni Day luncheon in Du Pont Court. Philip W. Moore, reunion chairman, 1031 Fishers Lane, Hubbard Woods, Ill.
- 1906 June 12-14. Snow Inn, Harwichport, Mass. James W. Kidder, reunion chairman, 215 Crosby Street, Arlington 74, Mass.
- 1911 June 8-10, returning to Cambridge for Alumni Day, June 11. Snow Inn, Harwichport, Mass. Alexander W. Yereance, reunion chairman, 80 Federal Street, Room 704, Boston 10.

- 1916 June 8-10. Coonamessett Inn, North Falmouth (Cape Cod), Mass. Class get-together at Copley Plaza on June 11 in afternoon. Ralph A. Fletcher, reunion chairman, P. O. Box 71, West Chelmsford, Mass.
- 1921 June 8-10. Sheldon House, Pine Orchard, Conn. Class get-together at Copley Plaza on June 11 in the afternoon. Irving D. Jakobson, reunion chairman, Jakobson Shipyard, Inc., West End Avenue, Oyster Bay, Long Island, N. Y.
- 1926 25th reunion. June 9 and 10. Hotel Griswold, New London, Conn., returning to Cambridge for Alumni Day, June 11. Alfred H. Dolben, reunion chairman, 17 Bond Street, Reading, Mass.
- 1936 June 9 and 10. Weekapaug Inn, Westerly, R. I. Fletcher P. Thornton, Jr., reunion chairman, W. E. Green Corporation, Woolworth Building, New York 7, N.Y.
- 1941 June 9 and 10. Hotel Curtis, Lenox, Mass. D. Reid Weedon, Jr., reunion chairman, 4 Overlook Way, Winchester, Mass.
- 1946-2 June 9 and 10. Everett Moore Baker House, M.I.T. All members of Class of 1946 invited. Theodore P. Heuchling, reunion chairman, Servomechanisms Laboratory, Building 32, M.I.T., Cambridge 39.
- 1946-6 Donald A. Hurter, reunion chairman, 108 Vernon Street, Norwood, Mass. See listing above for Class of 1946-2, for date and place.

Please consult the class secretary or reunion chairman for later details.

Credit for the discovery of the RDX high-explosive process belongs to Werner E. Bachmann of the University of Michigan, but Dr. Sheehan worked with him on its development and made substantial contributions. The process, which was put into operation on a vast scale during World War II, is estimated to have saved the United States more than \$200,000,000 in plant costs alone.

As a participant in the penicillin program at Merck and Company, Inc., Rahway, N.J., following his postdoctorate work at the University of Michigan, Dr. Sheehan had a large share in the devising of a practical synthesis of penicillamine, which is a key compound in the synthesis of penicillin itself. He likewise assisted in the syntheses of penicillic and isopenicillic acids—achievements which helped determine the structure of penicillin.

Dr. Sheehan joined the M.I.T. Faculty in 1946. Since then he has conducted investigations into other difficult problems in organic and biological chemistry. Born in Battle Creek, Mich., on September 23, 1915, Professor Sheehan obtained the B.S. degree in 1937 from Battle Creek College, and the M.S. in 1938 and the Ph.D. in 1941 from the University of Michigan. He worked as a postdoctorate research associate with Professor Bachmann at the University of Michigan under a contract with the National Defense Research Committee of the Office of Scientific Research and Development in 1941. He was employed as a research chemist by Merck and Company from 1941 to 1946. He was appointed assistant professor of chemistry at M.I.T. in 1946, and was promoted to the rank of associate professor in 1949.

## Of Students and Geology

**B**IRTHDAYS and visitors from foreign lands came in for their share of attention at the 280th meeting of the Alumni Council which was held in the Campus Room of the Graduate House on Monday, February 26, 1951. John A. Lunn, '17, President of the Association, called the 114 members and guests to order at the close of dinner, and announced that Godfrey L. Cabot, '81, a member of the Council, was observing his 90th birthday that evening. President Lunn then called on H. E. Lobdell, '17, Executive Vice-president of the Association, to introduce Richard W. Plummer, '26, a member of the M.I.T. Club of Mexico, who extended a cordial invitation to Alumni to visit the club when in Mexico.

In order, the business portion of the meeting was taken over by reporting that 11 Faculty and Council members had visited four Technology Clubs between January 23 and February 15; in announcing nominations of the various districts for Alumni to serve on the National Nominating Committee; nominations of Class Representatives from classes whose numerals end in two or seven; and in reporting a very successful midwinter alumni meeting, as already recorded in the March issue of The Review.

As general chairman for Alumni Day, 1951, Allen Latham, Jr., '30, named the following slate of committee personnel: *Banquet*: William H. Carlisle, Jr., '28, chairman, Stanley C. Dunning, '17, A. Robert Tonon, '22, David W. Skinner, '23, John J. Wilson, '29, Albert G. H. Dietz, '32, Laurance D. Sibley, '33, Russell Hastings, Jr., '34, Walter H. Farrell, '40; *Departmental*



*Reunions:* Julius A. Stratton, '23, chairman, Philip A. Stoddard, '40, Kenneth R. Wadleigh, '43; *Ladies' Events:* Mrs. Thomas P. Pitre, chairman, Mrs. Paul M. Chalmers, Mrs. Murray P. Horwood, '19, Mrs. Ralph T. Jope, Mrs. Henry B. Kane, Mrs. James R. Killian, Jr., Mrs. Robert M. Kimball; *Luncheon:* John M. Nalle, '20, chairman, Alan W. Burke, '20, Franklin K. Haven, '23, Clarence R. Westaway, '33, John L. Danforth, '40, Herbert H. Howell, '42, Otto E. Kirchner, Jr., '49; *Registration:* Wolcott A. Hokanson, Staff, chairman, G. Edward Nealand, '32, Robert E. Hewes, '43; *Transportation:* Emmons J. Whitcomb, '11, chairman, Malcolm S. Stevens, '34; *Stein Design:* Henry B. Kane, '24.

The President next introduced Professor B. Alden Thresher, '20, Director of Admissions, who spoke of the proposed extension of the Honorary Secretary system. In particular, he mentioned the several reasons that the Admissions Office needed to enlist more alumni assistance; the type of program which M.I.T. has followed in the past with the Honorary Secretaries; and the general principles of organizing an admissions-counselling program and its co-ordination with existing alumni activities.

President Lunn next presented the second speaker of the evening, Patrick M. Hurley, '40, Assistant Professor of Geology and Executive Officer of the Department. With the aid of charts Professor Hurley discussed the most recent theories of the origin of the earth with particular reference to the question of radioactive heating of the earth's interior. He discussed how the present thesis, that the earth is a large heat engine, contributes to a better understanding of the origin of mountain systems, and continents.

### ***Rifle Team Contends for National Championship***

**T**HIS year Technology's varsity rifle team has proved itself to be one of the nation's all-time outstanding teams. Under the able tutelage of Master Sergeant James K. Brahe, an instructor in the Department of Military Science and Tactics, the riflemen have won every match of the season with the exception of one. Among its list of "scalps" the Engineers can count West Point, Annapolis, Coast Guard Academy, the University of Maryland, Duquesne, the University of Pittsburgh, New York University, Columbia, St. John's University, and all the schools in the New England College Rifle League. Technology's only defeat was from the University of Maryland, in a triangular match with Maryland and West Point at College Park, Md. In this contest, the Maryland team fired a team score of 1440, out of a possible 1500, while M.I.T. and West Point registered 1432 and 1424, respectively. Both M.I.T. and Maryland broke the old national record of 1430 in the highly contested match. However, Technology avenged both the defeat and the new record, for only a few days after the event, the Engineers tied the new record of 1440 in a match with St. John's University in Brooklyn, and subsequently defeated the Maryland five-man team in the District of Columbia Championship.

The high-scoring M.I.T. rifle team is led by Captain Herbert B. Voelcker, Jr., '51, All-American, who last

year won the National Individual Championship and set a new national individual record. As well as captaining the rifle team, Mr. Voelcker has rowed for the past two years on the varsity 150-pound crew and is a member of Beta Theta Pi fraternity, Tau Beta Pi, Pi Tau Sigma, and Beaver Key. The other leading men on the Institute's rifle team include: Melville D. Bowers, '51, Allan B. Tanner, '52, Gene T. McCoy, '53, Arthur I. Auer, '52, Charles R. MacDonald, '51, John C. Champeny, '51, Malcolm D. Stuart, '51, Sarkis M. Zartarian, Jr., '52, and John F. Pasioka, '51. Mr. Bowers is a Navy veteran who transferred to M.I.T. last year from the University of Maryland. While at Maryland, Bowers shot on the 1949 national championship team and was an All-American the previous year. Mr. Tanner, who is also manager of the squad, together with fellow juniors Auer and Zartarian, has been shooting on the team ever since he was a freshman at the Institute two years ago. These three men, together with Mr. McCoy, a Marine veteran and a sophomore in Course XVII, should form the nucleus of another excellent team next year. To fill the vacancies which will be incurred by the graduation of seniors Voelcker, Bowers, Champeny, Stuart, MacDonald, and Pasioka, Coach Brahe has been grooming the freshman team into the best first-year squad Technology has had to date.

Along with participation in intercollegiate competition, the M.I.T. men have been entered in the Massachusetts Smallbore League for the past three years. This is a city-wide association of about 10 businessmen's rifle clubs which meet once a week for contests between the component teams. Though Technology has never been able to shoot its first team consistently in these week-night tourneys because of the pressure of school work, the scratch teams of freshmen, varsity, and junior varsity have gained valuable experience and have always ended in the upper bracket of the League. In connection with this phase of civilian shooting, the Institute's crack four-man team, composed of Bowers, Voelcker, Tanner, and MacDonald, recently won the New England William Randolph Hearst Citizens' Marksmanship Competition.

The M.I.T. rifle team holds all-time shooting records established at the University of Pittsburgh, Duquesne University, Rutgers University, New York University, St. John's University, Fordham University, U. S. Military Academy, U. S. Coast Guard Academy, and of course M.I.T. It has broken every range record on which it has shot this year, except that of the University of Maryland.

With such a record of accomplishment, the team is eagerly anticipating the National Intercollegiate Rifle Match, sponsored by the National Rifle Association, which is to be held on Saturday, April 7. Some 200 colleges will compete in 12 sectional matches throughout the United States on that date. M.I.T. will play host to approximately 15 colleges in the New England section.

Unless Selective Service disrupts the student enrollment at M.I.T. the future prospects for the M.I.T. rifle team are excellent, even though the squad will lose the majority of its members this year at commencement. The combination of excellent coaching, Athletic Association and student body support should insure M.I.T. of a winning team in the future.

## Earle F. Watts: 1897-1951

EARLE F. WATTS, Associate Professor of Drawing and Descriptive Geometry and Executive Officer of the Section of Graphics at M.I.T. died in Scituate, Mass., on March 10.

Professor Watts was born in Cambridge on October 16, 1897. He was educated in the public schools of Quincy, attended Thayer Academy, and was graduated from the Institute in 1920. Before joining the staff at M.I.T. as an instructor in drawing in 1925, Professor Watts had been a member of the faculty of the University of Missouri. In 1930 he was appointed assistant professor of drawing and descriptive geometry at M.I.T. and associate professor in 1944.

### Meteorologic Weather Vane

AN important meeting of the Visiting Committee on the Department of Meteorology\* was held on January 23, 1950. President Killian and Thomas K. Sherwood, '24, Dean of Engineering, represented the Administration, and Professors Henry G. Houghton, Jr., '27, and Hurd C. Willett, the Department. The Committee's report is summarized below:

The Committee feels that the staff of the Department of Meteorology is strong and energetic and that the student body is wholesomely abundant. At the present time there are approximately 30 undergraduates and 35 graduate students in the meteorological courses. To some members of the Committee, it appears that the present undergraduate curriculum in the Department prescribes too much specialization in meteorology, and that students should rather have more general physics and mathematics in preparation for the graduate work in Meteorology. It was suggested that the senior year, alone, might be reserved for the technical meteorological courses, but this point needs further consideration both by the Department and the M.I.T. Administration.

The widening of the field of activity of the properly trained meteorologist leads to the consideration of providing a joint training in Meteorology and some field of engineering. It would not be difficult, as pointed out by the meteorologists of the staff and of the Committee, to set up an attractive five-year course leading to the degree of meteorological engineer. Greater emphasis, the Committee believes, should be placed on studies and instruction in climatology. These matters need further investigation, both by the Department and the Administration. It was suggested that some of the advanced teaching might be in the nature of the case system instruction.

The principal employers of the holders of master's degrees in Meteorology are the government weather service and the air forces. The private air lines depend pretty well on the government meteorologists and do not employ many trained weather forecasters. Members of the Committee proposed that the employment of trained meteorologists by industrial concerns should be studied and encouraged. There are many industries, such as the power companies, the

\*Members of this Committee for 1949-1950 were: Harlow Shapley, chairman, Franklin W. Hobbs, '89, Raymond Stevens, '17, Athelstan F. Spilhaus, '33, Harry Wexler, '39, Commander F. W. Reichelderfer, and Brigadier General Donald N. Yates.

farm implement manufacturers, and the fruit and vegetable growers, for example, that could profitably employ experts in meteorology and climatology.

The Department of Meteorology is now working on five major research contracts, all of government origin: the application of radar to various meteorological problems, for the Signal Corps; the mechanism of the earth's atmospheric pressure changes, for the Office of Naval Research; studies of the general circulation of the atmosphere, for the Air Force; and, an additional contract extending the study of the general circulation to the Southern Hemisphere, for the Weather Bureau.

Finally, it was noted that there are only a few departments in America where graduate instruction in meteorology is offered, and none is as large and well equipped as is the Institute's meteorological organization. The Institute has a responsibility, therefore, for maintaining a high standard, for re-examining, from time to time, the content of the field, and for always striving toward new technical developments. The Committee feels that the Department is meeting these obligations exceedingly well.

### Crew Has Bright Prospects

WITH six veterans of last season's crew in training on the Charles River, and a good season in retrospect, the M.I.T. crew has bright prospects for an enviable season in 1951. The six veteran crew members are: Donald A. Christensen, '52; John C. Casson, '52; Paul G. Smith, '51, captain; Richard D. Semple, '52; Forest C. Monkman, Jr., '51; and Allen B. Fonda, '51, stroke.

The schedule for the 1951 spring season is as follows: April 21, Harvard and Boston University at M.I.T.; April 28, M.I.T. at Rutgers University; May 5, Harvard, Princeton, and M.I.T. in the Compton Cup Regatta at M.I.T.; May 19, Eastern Association of Rowing Colleges Spring Regatta at Princeton; June 16, Intercollegiate Rowing Association Regatta at Marietta, Ohio.

During the 1950 season, Technology's first race was rowed on the Charles River against Harvard and Boston University. Harvard won over M.I.T. by less than half a length, and Boston University came in third. The next race, the Compton Cup Regatta (named after Karl T. Compton, chairman of the M.I.T. Corporation), was held at Princeton, and Harvard again defeated M.I.T. by less than one foot — with Princeton third and Rutgers fourth. The Eastern Association of Rowing Colleges Sprint Regatta was the most important race of the regatta season and was held at Annapolis in late May. M.I.T. was finally able to defeat Harvard by four feet and in so doing won the regatta. Our post-season event was the Intercollegiate Rowing Association Regatta which was held at Marietta, Ohio. This race was held at a new location and was badly upset by a flash flood which practically ruined the regatta. However, we were able to salvage fifth place. One high light of the season was that Captain Robert C. Weber, '50, was nominated to the 1950 All-American Crew. James B. McMillin, '43, is head coach of crew at M.I.T.

(Continued on page 308)



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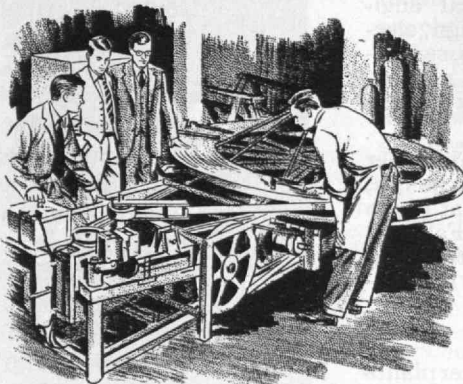
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Take the case of a cyclotron being built by a great Western university for special studies of the atom. The construction of this machine offers an unusual example of the use of copper not only in invention and science, but also education. An essential part of the project was the utilization of the university's own personnel, so far as possible, not only in design, but in construction and assembly. A large group of staff members, engineers, research assistants, electronic technicians, and machinists was formed. Included among the personnel were graduates and graduate students in physics.

The first major undertaking of the cyclotron group was the winding of the seven miles of Copper Bus Bar, supplied by Revere in soft temper, free from scale, rounded edges, to form the great coils for the electromagnet. The necessary winding machine for this work was built in the university shops, largely of surplus materials. It took four months to complete the coils and test each silver-brazed joint. Another important part of the cyclotron was shaped in the shop out of copper sheet, 4,000 pounds of it; the work on this is a story in itself. The heaviest part naturally is the special alloy steel core, weighing about 200 tons, forged in six pieces. Pole faces were machined parallel to

a tolerance of  $2\frac{1}{2}$  thousandths of an inch, an excellent record on a piece of steel of such a large diameter (over five feet) as is required for the instrument. It is calculated that the magnetic force of attraction between the two poles will reach 160 tons when the current is flowing through the copper coils. We have spoken of copper's high electrical conductivity; another way to express it is that copper has low electrical resistance. The total resistance of the seven miles of Revere Copper in the coils is only one ohm, or less than a hundredth of the resistance of the glowing tungsten wire in a 100-watt light bulb. Tungsten has high resistance, which is why it becomes white hot; copper has low resistance or high conductivity, so that it can carry large amounts of power with minimum loss, little heating.

Eventually this cyclotron will add to man's knowledge of the atom. In the meantime, it has been a project of high educational value, and also an economical one; use of the university's own personnel and facilities cut the cost approximately in half. Revere is glad that it was asked to meet the high specifications drawn up for the copper, but it should also be recognized that many other firms supplied materials, such as the steel company, the makers of insulating paper and plastics, of cement, motor generators, electron tubes, and so on. Demands such as these for high quality demonstrate that American industry can meet challenges. So Revere suggests that the more complex and severe your requirements, no matter what the end product is to be, the more advisable it is for you to draw upon the knowledge and experience of suppliers. They can help not only on something as simple as a shoe, but on complicated machines, like an airplane—or an atom-smasher.



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## THE INSTITUTE GAZETTE

(Continued from page 306)

### Notabilia

**T**HE significant support which the Institute's Faculty and staff have lent to the development of modern physics was again demonstrated in February when the 1951 annual meeting of the American Physical Society was held at Columbia University.

Professor John C. Slater, Head of the Department of Physics, delivered the Richtmyer Lecture on "The Electron Theory of Solids." In addition, two Technology professors—Sanborn C. Brown, 10-44, and Jerrold R. Zacharias—presided at technical sessions on "Discharge in Gases" and "Invited Papers in Nuclear Physics," respectively.

But a more accurate estimate of the role which the Institute plays in modern physics may be gleaned from the fact that 36 technical papers on the program were delivered by the contingent from Cambridge. Of a total program of 319 papers, the Institute contributed slightly more than 10 per cent. Other substantial contributors were: Columbia University, who presented 23 papers; Brookhaven National Laboratory, 18 papers; Yale University, 17 papers; Harvard University, 15; Cornell, 13; and the University of California, 12.

Presented by M.I.T. members were the following technical papers:

"Decay Processes Observed in a Multiple Plate Cloud Chamber at 10,600 Feet" by Herbert S. Bridge, Frank B. Harris, Jr., '49, and Bruno B. Rossi.

"Angular Distribution of the Ground-State Deuteron Peak from the  $\text{Be}^9(p,d)\text{Be}^8$  Reaction" by John A. Harvey; "Energy Levels in Li" by Harry E. Gove and John A. Harvey.

"Energy Levels in  $\text{F}^{20}$  from the  $\text{F}^{19}(d,p)\text{F}^{20}$  Reaction" by Hugh A. Watson, Douglas M. Van Patter, '49, and William W. Buechner, '35; "Energy Levels in  $\text{Na}^{24}$  from  $\text{Na}^{23}(d,p)\text{Na}^{24}$ " by Anthony Spurduto, '42, and William W. Buecher, '35; "Magnetic Analysis of the  $\text{Si}^{30}(d,p)\text{Si}^{31}$  Reaction" by Douglas M. Van Patter, '49, Harald A. Enge, and William W. Buechner, '35; "The  $\text{Mn}^{55}(p,n)\text{Fe}^{55}$  Neutron Spectrum" by Paul H. Stelson and William M. Preston.

"Absorption Measurements on the Neutral Radiation Producing Penetrating Showers" by H. W. Boehmer and Herbert S. Bridge.

"Recent Studies of Electron Collision Cross Sections at Low Energies" by Sanborn C. Brown, 10-44; "Neutron Capture Gamma-Rays" by Bernard Margolis; "Inelastic Scattering of Neutrons" by Walter Hauser, '50, and Herman Feshbach, '42.

"The Ionic Displacement in Barium Titanate" by Harald C. Schweinler; " $\text{BaTiO}_3$  Single-Domain Crystals at Low Temperature" by Walter J. Merz; "Optical and Electrical Measurements on Rutile Single Crystals" by Donald C. Cronmeyer.

"Van de Graaff Injector for Brookhaven Cosmotron" by R. G. Herb (University of Wisconsin), John G. Trump, '33, John L. Danforth, '40, and E. Alfred Burrill, '43; "Operation of the M.I.T. Rockefeller Electro-

(Continued on page 310)

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## THE INSTITUTE GAZETTE

(Continued from page 308)

static Generator" by William M. Preston and Clark Goodman, '40; "Effect of Ducts on the Attenuation of Neutrons and Gamma-Rays in the M.I.T. Cyclotron Shield" by John W. Crawford, Jr., 9-46, Edwin E. Kintner, 9-46, and Clark Goodman, '40.

"Plasma Oscillations in a Static Magnetic Field" by Eugene P. Gross.

"A Phenomenological Treatment of Photo-Meson Production from Deuterons" by Melvin Lax, '43 (Syracuse University), Herman Feshbach, '42, G. F. Chew (University of Illinois), and H. W. Lewis (University of California); "Photon-Meson Production from Deuterons" by M. L. Goldberger (University of Chicago), Felix M. H. Villars, and Herman Feshbach, '42.

"Positron Annihilation" by Martin Deutsch, '37; "The Microwave Spectra of the Deutero-Ammonias" by Max T. Weiss, '47, and Malcolm W. P. Strandberg, '48; "The Rotational Magnetic Moment of  $\Sigma$ -Polyatomic Molecules" by John R. Eshbach and Malcolm W. P. Strandberg, '48; "Centrifugal Distortion in Asymmetric Molecules, HDS" by Richard E. Hillger and Malcolm W. P. Strandberg, '48; "Microwave Spectrum of Ketene" by Horace R. Johnson, Julian G. Ingersoll, and Malcolm W. P. Strandberg, '48; "Microwave Absorption Spectrum of Oxygen" by Bajirao V. Gokhale and Malcolm W. P. Strandberg, '48.

"Resistance Minima in Metals" by Harold E. Rorschach, Jr., '49, and Melvin A. Herlin, '48; "Magnetic Dipole Interactions in Crystals Near Absolute Zero" by Morton B. Prince and Melvin A. Herlin, '48; "Pressure Variation of Second Sound Velocity in Helium II" by Robert D. Maurer and Melvin A. Herlin, '48.

"Optical Absorption and Photo-Conductivity in Amorphous and Hexagonal Selenium" by M. Alten Gilleo, '48.

"Beta-Gamma Angular Correlation in the Decay of  $Sb^{124}$ ,  $I^{124}$ , and  $I^{126}$ " by Donald T. Stevenson, '50.

"Report on the Gaseous Electronics Conference of October, 1950" by William P. Allis, '23; "Annihilation of Swift Positrons" by James W. Shearer, 6-45, and Martin Deutsch, '37; "Radiation Loss of Electrons" by Lee M. Spetner and Joe S. Clark, '37.

"The Paramagnetic Spectrum of Ammonium Chrome Alum" by Arthur F. Kip, Renato Malvano, and Charles F. Davis, Jr.; "Nuclear Magnetic Moment Ratios of Isotopic Pairs" by Norman I. Adams, 3d, Thomas F. Wimett, 2-46, and Francis Bitter.

### For Physical Fitness

THE well being of the Institute's students, Faculty, and staff, now numbering more than 10,000 persons, was the primary topic of discussion at the meeting of the Visiting Committee on the Medical Department\*, held on March 6, 1950. In addition to the

(Continued on page 312)

\* Members of this Committee for 1949-1950 were: Donald F. Carpenter, '22, chairman, Dr. James H. Means, '06, Harold Bugbee, '20, Dr. Egon E. Kattwinkel, '23, Dr. Marian Ropes Fielding, '26, Dr. Arlie V. Bock, and J. Willard Hayden.



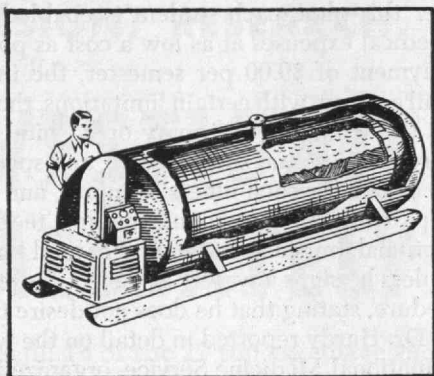
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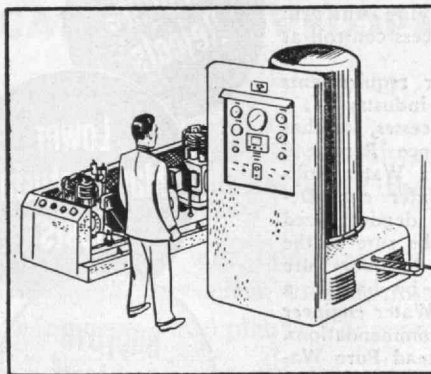
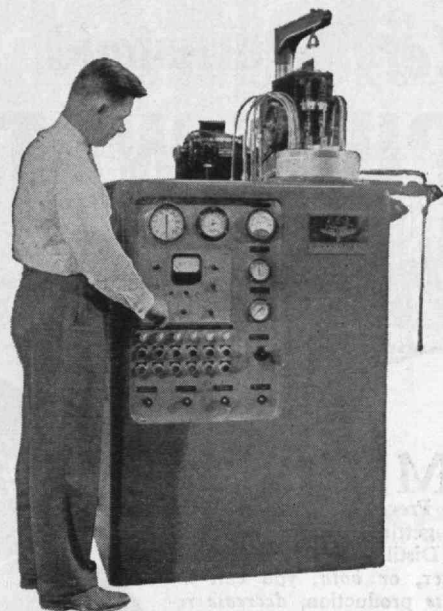
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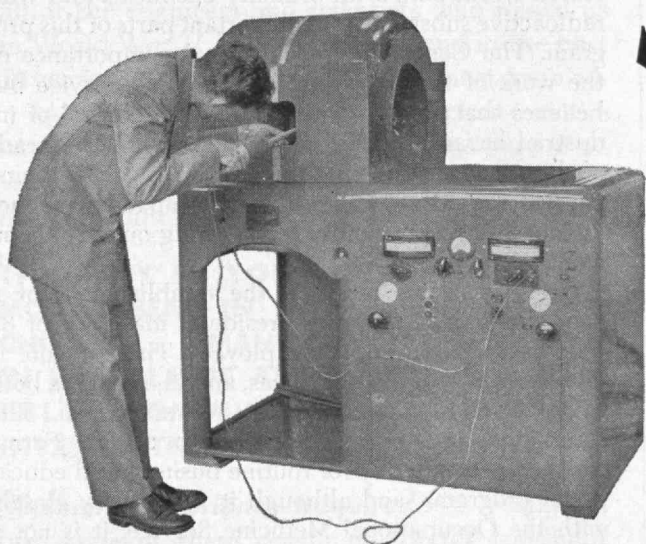
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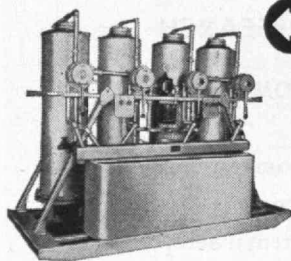
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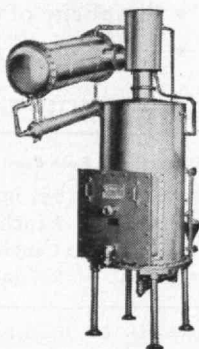
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## THE INSTITUTE GAZETTE (Continued from page 310)

Committee members present, Dr. Dana L. Farnsworth, Medical Director, Dr. John W. Chamberlain, '28, Associate Medical Director, and Dr. Harriet L. Hardy, Assistant Medical Director, were also present.

In a review of the year's activities, Dr. Farnsworth gave special reference to the financial policy of the Department. He expressed the idea that any further expansion of service by the Medical Department should be done only when such extension is financially self-supporting. This recommendation was made not only because economic conditions make it desirable, but also because it is psychologically desirable for the students to support services that are primarily for their own welfare.

Dr. Farnsworth also outlined a health insurance plan for students which was endorsed by the Committee and went into effect in the fall of this year. Under this plan, each student is enabled to budget his medical expenses at as low a cost as possible. For the payment of \$9.00 per semester, the insuring agency will assume, with certain limitations, the cost of a room in the Homberg Infirmary or hospital up to \$13 per day, medical and surgical care, and special charges up to \$1,000 for each illness or injury, and up to \$100 for repair of injury to sound, natural teeth. The plan is optional, but each student is charged for the insurance unless he signs a waiver as part of his registration procedure, stating that he does not desire to have it.

Dr. Hardy reported in detail on the work of the Occupational Medicine Service, organized as part of the Medical Department about two years ago. This service is for the special convenience and protection of employees, students, and others who may be exposed to health hazards in the course of their work. Special attention is paid to the prevention of illness or injury. The removal and control of hazards arising from research work, both with ordinary chemicals and with radioactive substances, are important parts of this program. The Committee recognizes the importance of the work of the Occupational Medicine Service but believes that the responsibility for the control of industrial hazards should lie primarily with the heads of departments, and that the Occupational Medicine Service should act in an advisory capacity and not assume full responsibility for carrying out its recommendations.

Dr. Farnsworth reported the establishment of a Safety Committee by the President, made up of 32 staff members and other employees. The Institute is divided into geographical areas, and in each area both the staff and employees have representation. The committee, under the chairmanship of Dr. Farnsworth, meets monthly for routine business and educational programs, and although it works very closely with the Occupational Medicine Service, it is not a part of the Medical Department.

The need for additional space for the Medical Department was discussed, since the Occupational Medicine Service is without suitable office space. In

(Continued on page 314)

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## THE INSTITUTE GAZETTE

(Continued from page 312)

addition, offices are needed for about four other persons, including a psychiatrist, an internist, and any Fellows who may be in training. The addition of a fourth floor to the Homberg Infirmary would provide suitable space for this latter purpose. The Committee explored other possibilities without making specific recommendations. The Medical Department has been recently renovated, major repair of the ventilating system has been made, and a new record room and two new offices for secretaries have been obtained.

The Committee continues to feel the desirability of inaugurating a department of physiotherapy and recommends that such a service be established as soon as practical. Through the generosity of J. Willard Hayden, a new x-ray machine has been installed, thus completing the modernization of the X-ray Department at the Institute.

The Committee then studied means for providing the necessary space for the services that do not have adequate housing. It was unable to find suitable space and recommends that further study be made in this direction, since this is now the most urgent need confronting the Medical Department.

### Professor Soderberg Honored

PROFESSOR C. RICHARD SODERBERG, Head of the Department of Mechanical Engineering at the Institute, returned in March from Sweden where he was awarded the honorary degree of doctor of technology by the Chalmers Institute of Technology, one of Europe's most distinguished technical institutions. Chalmers Institute of Technology was founded in 1830, beginning as a school of naval architecture and expanding to become an outstanding institution of higher learning. In recent years it has become one of the world's centers of important developments in communications theory.

Dr. Soderberg was graduated from Chalmers Institute in 1919, and the honorary degree which was awarded to him was the first of its rank to be given by the institution. Dr. Soderberg joined the staff of M.I.T. in 1938 and is widely known as an authority on turbine design.

### Building Engineering Recommendations

THE Visiting Committee on the Department of Building Engineering and Construction\* met at the Institute on April 25, 1950. All the members of the Committee were present, and President Killian and Thomas K. Sherwood, '24, Dean of Engineering, participated in the discussions of most of the items on the agenda.

(Continued on page 316)

\* Members of this Committee for 1949-1950 were: C. George Dandrow, '22, chairman, Harry J. Carlson, '92, John H. Hes-sion, '13, Harold Bugbee, '20, Miles N. Clair, '23, Lou R. Crandall, and Henry R. Shepley.

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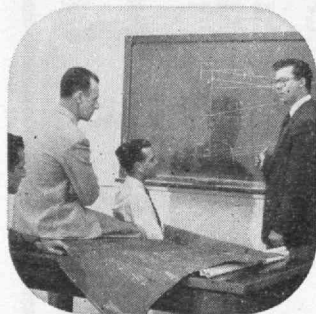
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## THE INSTITUTE GAZETTE

(Continued from page 314)

Changes in curriculum which might be occasioned by the proposed increase in emphasis on humanities, closer liaison with the School of Architecture, departmental conferences, enrollment, and the status of various research projects were the principal items under consideration at the meeting. As a consequence of this meeting, the Committee formulated the following five recommendations to the Department and to the Administration of the Institute.

1. The Committee recommends that the Department examine very carefully the present curriculum and re-evaluate all phases of the program, in order to be ready to join the rest of the Institute in broadening the program of humanities in the event that such action is taken. At the same time, the Department is cautioned not to impair the soundness of the basic technological training given the students, because this training is difficult, if not impossible, to obtain after graduation. In this connection, the Committee appreciates very much the explanations of the Institute's thinking on the subject of a broadened curriculum as set forth by President Killian and Dean Sherwood.

2. The Committee recommends that the Department continue to strengthen its policy of providing the students with basic training in such related fields as electrical engineering and heat engineering, rather

(Continued on page 318)

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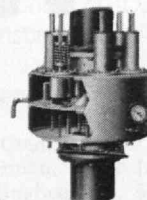
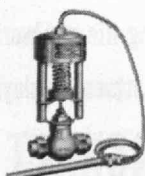
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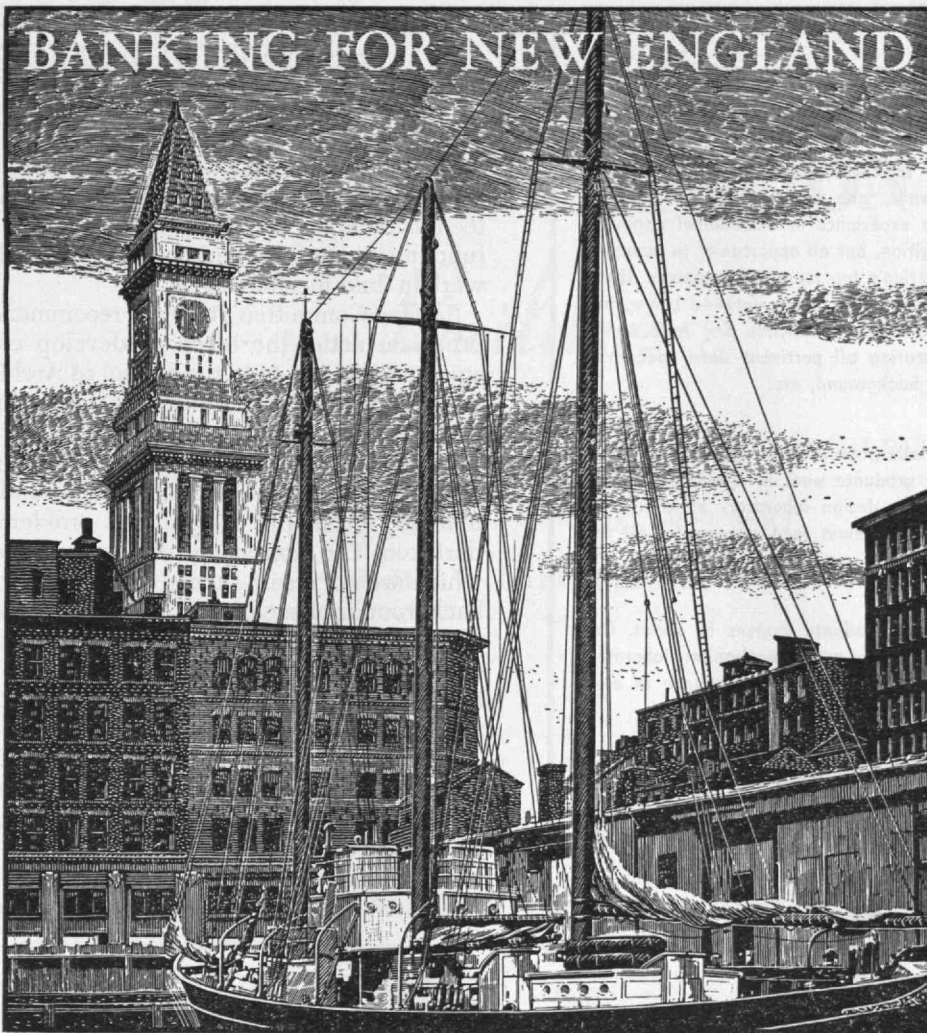


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## THE INSTITUTE GAZETTE

(Continued from page 316)

than providing informative courses in existing practice with respect to equipment of buildings. The Committee recommends that, if at all possible, the program of fundamentals of engineering be extended to include work in fluid mechanics.

3. The Committee strongly recommends that appropriate action be taken to develop closer liaison among the students in the School of Architecture and in the Department of Building Engineering and Construction. It seems best to attempt such liaison in the third and fourth years when the students in each Department have sufficient background to permit mutually profitable co-operative problems to be undertaken. The interchange of ideas and points of view which would result should measurably broaden the backgrounds of each group of students. Such co-operation is deemed to be a better way to acquaint the students in building with the problems and methods of architectural planning than would any short course in planning principles.

4. The Committee recommends that the program of departmental conferences, to which speakers of recognized authority in the various phases of construction and related fields are invited, be continued and strengthened and that the Administration of the Institute assist in the furtherance of the program. Summer

(Concluded on page 320)

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## THE INSTITUTE GAZETTE

(Concluded from page 318)

conferences, such as the Conference on Mechanical Properties of Plastics, largely developed as a consequence of the research program in mechanical properties of plastics, should be encouraged and extended.

5. The Committee reviewed the various research projects being conducted by the Department and the prospects of continuance of outside support of these projects. Particular interest was expressed in the plastics and masonry materials research programs. The Committee deemed these to be of such basic and long-range value that every effort should be made to assure their continuance.

### Theodore Roosevelt's Letters

SIGNIFICANT research in the field of political science continues at the Institute, as the first two of eight projected volumes of *The Letters of Theodore Roosevelt* are announced for publication this spring. Since 1948, the Roosevelt Research Project has been working at M.I.T. under the direction of Elting E. Morison, Associate Professor of English. The Roosevelt Memorial Association and Harvard University Press have joined Technology in providing funds, space, equipment, and research aids for this work. Although a research project of this type is somewhat unusual for an institute of technology, it is in keeping with the Institute's expanded educational program in political science, economics, and international relations in the School of Humanities and Social Studies.

### Guide for Visitors

ALUMNI who have not visited the Institute for several years will find that many changes have transpired, while those whose last visit to Technology antedates the beginning of World War II may find some difficulty in recognizing many buildings long in regular use.

The Institute's expanded size also frequently leaves the visitor in bewilderment. To meet the need for a compact, convenient means of directing strangers to the desired spot on the Institute's 100-acre campus, *A Visitor's Guide* has recently been published. The center spread contains a map showing M.I.T. property which now extends along the Charles River Basin for



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more than a mile — from the Crew Boat House near the Cottage Farm Bridge (recently renamed Boston University Bridge) to the recently acquired Lever House near Kendall Square. The map shows the complete grouping of academic buildings, living quarters, recreational facilities and playing fields. The *Guide* also contains information regarding the Information Office, the Institute's library system, museums, laboratories, student housing, athletic facilities, and Walker Memorial.

## SAILING AT M.I.T.

(Continued from page 302)

makes use of the M.I.T. facilities to introduce their students to the water. The contacts thus made between Technology students and other institutions in the Boston area have done much to improve the relationships between these schools. With its easy camaraderie, sailing tends to engender lasting and close friendships between the competitors to a degree not found in any other field of sport.

The problem of teaching several hundred novice sailors each year has been solved by evolving an organized program of instruction in which qualified volunteer students assist in teaching. The teaching experience obtained by the volunteer instructors makes them much sought after by private yacht clubs all over the East. Each year, the number of opportunities for such instructors to become junior instructors in private clubs exceeds the number of persons available. Summer jobs in sailing instruction offer many students an opportunity for a healthy outdoor life and an opportunity to put into practice their qualities of leadership and organization.

Fifteen years of hard sailing, and the inevitable minor accidents which occur when novices learn to sail have taken their toll, and the original Technology fleet is nearing the end of its useful life. The need for a new fleet has long been recognized by the Administration of the Institute, but action has been delayed until the more pressing needs of the Development Program for increased academic facilities could be met. With the successful completion of the Development Committee's work, it is our hope that sailing will receive financial help toward a new fleet from the many sailing alumni who have enjoyed so many days of sailing in the sport they have loved so well.

The high cost of wooden boat construction, and the lack of skilled workmen in this trade at the present time, indicate that a new method of construction

(Concluded on page 322)

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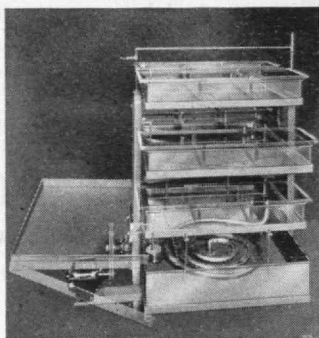


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## SAILING AT M.I.T.

(Concluded from page 321)

should be used in such a new fleet. Fiberglas and plastic have been combined to make a very durable and satisfactory small boat which would be suitable for use in such a fleet. One such boat has been made and tried out at Technology with very satisfactory results. Hulls from plastic-impregnated Fiberglas are uniform, durable, and easily maintained at low cost. Initial cost of boats made from this material is lower than that for boats of similar size but made of wood. None of the colleges have a fleet of boats made of Fiberglas, but this new material will probably be used extensively in any new fleets which come into being.

During World War II, restrictions on travel made the sailing program more popular than ever. At the same time, the Institute's enlarged population from the Army, Navy, Chemical Warfare Service, and a large force of the Division of Industrial Cooperation increased the number of persons who found relaxation in dinghy sailing. While the intensive three-term program at M.I.T. was in force, the use of the boats increased from approximately 14,000 hours to 20,000 hours yearly. We are now entering a period similar to that of World War II, in which use of the Technology fleet is increasing rapidly. To help meet the recreational needs of the Institute's students, Faculty, and staff, under the strenuous program of teaching and research which is required today, it is essential that Technology's fleet be strengthened with new boats which should once more admirably serve our needs in the years ahead.

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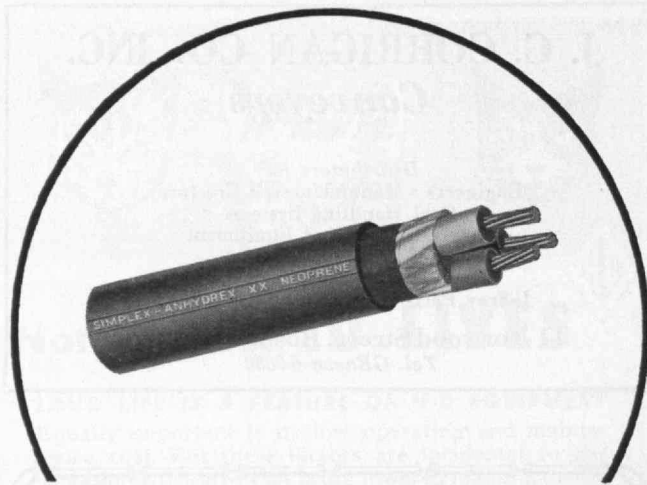
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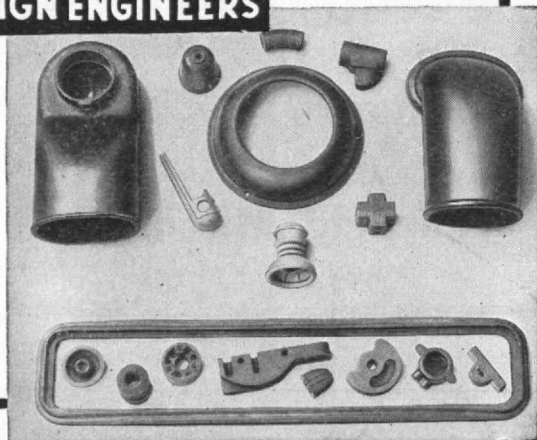
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## THE GREAT DREAM

(Continued from page 297)

*Terra Australis*. If it were a continent, one would have to find out whether it had a southern end. With orders to that effect, Fernão Magalhães (Magellan, to give the English version of his name) left Europe in 1519. For a short while he was fooled by the La Plata River which is large enough to look like an arm of the sea. But the mistake was realized quickly and Magellan continued south, until he found the strait which now bears his name. Beyond that strait came open sea, an exceptionally large open sea. Magellan crossed it under great hardships. He himself found death in the Philippines, but his ships completed the first circumnavigation of the globe.

Brazil, or South America, was not *Terra Australis* and Magellan had proved—oh no, Magellan had only proved what another mathematician and geographer of Nuremberg had prophesied in 1515, four years before Magellan left port. That mathematician, Johannes Schöner, had made a beautiful globe in that year, a globe on which all the latest discoveries were shown. There was Africa with a free tip in the south, showing just how Vasco da Gama had sailed around it. There were indications of North America, and there was South America, somewhat small, but correct in outline as far as one could tell then. Like Africa, it had a free southern tip, but while the sea below Africa was comparatively broad, there was only a small channel south of South America. And beyond the channel loomed *Terra Australis* in enormous size, well equipped with bays and capes, mountains and rivers.

Schöner had, by way of his globe, predicted that one would be able to sail around South America's southern tip. The Portuguese seaman, Magellan, sailing for the king of Spain, had actually done it. But he himself had reported that conditions were not the same as at the southern tip of Africa: *there* was a wide open sea. *Here* Magellan had sailed with great danger through a comparatively narrow channel. To his left he had seen other land, and had seen it clearly enough to name it even. It was Tierra del Fuego—

(Concluded on page 326)

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## THE GREAT DREAM

(Concluded from page 324)

certainly a northern promontory of *Terra Australis* which reached much farther north elsewhere.

While Magellan, sailing for Spain, had put one corner of *Terra Australis* on the map, Dom Jorge de Menezes, journeying for Portugal, provided another one. In 1526 a storm had driven him east from Borneo and he had seen a coast where a strange black race of people, very unlike the Malaysians, was living. Nothing was done about that coast then, but it was rediscovered 19 years later by a Spanish vessel under Captain Inigo Ortiz de Retes, who fought a fierce battle with the long war canoes of these black people. He saw high mountains beyond the coast line, and he called the coast New Guinea, probably because the Papuans reminded him of the African Negroes. In Europe the name was given a different meaning. The Guinea Coast of Africa was, naturally, the coast of a continent. The New Guinea Coast was a continental coast, too—the continent being *Terra Australis*.

Part II of Mr. Ley's article will appear in the May Review. In his conclusion, the author recounts the search for *Terra Australis* which continued through the Sixteenth Century into the Eighteenth, when Captain Cook dispelled the dream of the Great Unknown Southland.—Ed.

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# What GENERAL ELECTRIC People Are Saying

E. L. AUYER  
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## *Apparatus Department*

**JET NOISE:** Since its inception the noise problem associated with turbojets has received considerable attention from the public as well as from industry. Noise control at test facilities has shown some excellent results, but noise control on an installation appears to be impractical. Since absolute measurements are always subject to question because of variation in methods of measurement and interpretation as well as variations between individuals concerning discomfort encountered, it is well to compare a known familiar noise with the new unknown noise.

The public is generally familiar with the noise level associated with conventional aircraft as the aircraft passes overhead. Therefore noise measurements on the ground were made as a piston engine aircraft passed overhead and also as a turbojet airplane passed overhead. Identical methods and measuring equipment were used for both tests, and both types of aircraft were operated at normal cruise power settings.

The results . . . indicate that noise levels for the turbojet were actually much lower than the noise levels of the piston aircraft. In addition the ground observer is subjected to the turbojet noise for only 20 seconds, while the piston aircraft noise persisted above background level for 70 seconds. In both cases the aircraft were flown directly overhead at an altitude of 1000 feet. The same pattern existed for the test made at 5000 feet.

*Institute of Aeronautical Sciences  
New York, New York  
January 29, 1951*



T. W. DRIESCH

## *Apparatus Department*

**MOTOR BRAKE:** After man had invented the wheel, he was immediately confronted with the problem of bringing to a stop whatever the wheel moved. . . . With the ad-

vent of the machine age, it became more important to develop brakes to retard and stop revolving machinery, and the first hand brake resulted. . . . The later use of electric power, in the form of motor drives with ever-increasing speeds and horsepower, demanded brakes of greater capacity and reliability. Electricity then took the place of muscular effort.

During the past 50 years, designs have been developed with a multitude of variations in shoe or band arrangements, with one or more springs, and with numerous links, levers, and pins. The majority of those brakes had only one magnet and used a system of mechanical linkages to multiply the force of the magnet to release the shoe pressure.

The major objectives in the development of the new brake described in this article were: (1) to reduce the number of wearing parts, (2) to obtain faster operation, (3) to simplify the means of making adjustments, and (4) to have fewer parts. . . . These objectives aim at decreased maintenance. Other advantages include improved performance and appearance.

*General Electric Review  
February, 1951*



A. H. HEMKER

## *Apparatus Department*

**FARM POWER:** The fact that farmers are dependent on electricity more and more has brought to focus the last year or two a question: What do you do when the power goes off? . . .

Take a dairyman who is milking, say 50 cows. How does he milk them if his milking machine won't run? In some cases this may even be a physical impossibility. Think of the inconvenience on any farm if the water pump doesn't work. If the

power interruption is of long duration, what about the farm freezer? Many farm homes are considerably electrified, and probably the most important electric item in the farm home is the electric motor that runs the oil burner or stoker that keeps the home comfortable.

Take the poultryman who may have chicks under the brooder or who heats the brooder house with an oil or stoker heating plant. Take the poultryman with a thousand layers or more who lengthens the working day of his layers by having lights in his poultry house. A few interruptions in this light cycle would throw his complete flock off production and might even put them into a molt.

Another example of the importance of electricity is the truck garden or greenhouse operator who has electric heat in his benches or who depends on automatic heat with his stoker to heat his greenhouse. Loss of power in these cases might mean a loss of considerable money.

A standby electric power generator is the answer to the above questions, but I believe it is necessary that we take a sensible view of the farmer's requirements, even though a farm may have 20 or 30 kilowatts of connected load. It isn't necessary that he protect himself for his possible maximum use. . . . I believe a three-kva generator will take care of most farmers' emergency needs. . . . I believe in most cases it would be silly to saddle the farm with a complete engine-generator set when the use of it may average only once a year. . . . All farmers have a prime mover which is used nearly every day. . . . I am speaking, of course, of the farm tractor.

*American Society of Agricultural Engineers*

*Chicago, Illinois  
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# Alumni AND Officers IN THE News

## High Esteem

The 1950 Edison Medal was awarded to OTTO B. BLACKWELL'06 by the American Institute of Electrical Engineers in January. The medal "is awarded to a resident of the United States or Canada for meritorious achievement in electrical science, electrical engineering or the electrical arts."

IRVING W. WILSON'11 has been named the aluminum industry's "Man of the Year" by *Modern Metals* magazine. Mr. Wilson is senior vice-president of the Aluminum Company of America.

The French Government elected DONALD W. DOUGLAS'14, President of the Douglas Aircraft Company, to the Legion of Honor.

ROBERT S. HARRIS'28 was decorated by the president of Ecuador who bestowed on him the title, "Oficial" in the national order, "Al Merito." The decoration was given in Quito on January 30 in recognition of the assistance Dr. Harris has given Latin American countries. He is currently serving as scientific director of Ecuador's National Institute of Nutrition.

PIETRO BELLUSCHI, staff, has been given an honorary LL.D. degree by Reed College, Portland, Ore. Dean Belluschi was praised for his "imaginative use of modern materials and disciplined sense of form . . . he has contributed richly to the development of modern design."

## By-lines

ARNOLD B. BAILEY'25 is the author of a 595-page book entitled, *TV and Other Receiving Antennas*, published in January by the John F. Rider Publishing Company of New York.

J. WHITNEY PERRY'31 has written a textbook for classes and self-study which was published in July by Interscience Publishers, Inc., New York. The 816-page volume, *Scientific Russian*, is intended primarily to acquaint the reader with technical Russian printed matter.

*Quality Control: Principles, Practice and Administration* was published in February by the McGraw-Hill Book Company. The author of this technical volume is ARMAND V. FEIGENBAUM'48.

RICHARD S. BAER, staff, and Orvil E. A. Bolduan are coauthors of the article, "Periodic Statistical Distortion of Unidirectionally Ordered Diffractors, with Application to Collagen," which was published in the February, 1951, issue of the *Journal of Applied Physics*.

## New Duties

WILLIAM T. ALDRICH'01 was elected president of the board of trustees of the New England Conservatory of Music in February.

RUDOLPH B. WEILER'08 has been elected president of the Chester County chapter of the Pennsylvania Society of Professional Engineers.

On February 5, JOHN M. BIERER'10 became president of the Boston Woven Hose and Rubber Company. H. B. RICHMOND'14 has been named first vice-president and MARSHALL B. DALTON'15 was elected a director of this 75-year-old Cambridge concern.

ROBERT T. HALSAM'11 has been elected a director of the Worthington Pump and Machinery Corporation.

The appointment of FRANK J. JEROME'14 as executive vice-president of the New York Central Railroad was announced on February 23.

JOHN B. INGLE'16 was appointed director of the United States Government's rubber procurement program.

WALTER J. BEADLE'17 has been elected to the board of directors of the Philadelphia National Bank.

Announcement was made in late January that ERIC F. HODGINS'22 is a member of the five-man Materials Policy Commission appointed by President Truman.

RICHARD L. BOWDITCH'23 has been named to head the transportation, public utilities, fuel, service and imports and exports division of the Federal Office of Price Stabilization.

JOHN E. BURCHARD'23 has been elected a member-at-large of the American Council of Learned Societies.

THOMAS S. COMBS'32, Rear Admiral, U.S.N., will assume new duties as chief of the Navy's Bureau of Aeronautics on May 1.

Appointment of GERVAIS W. TRICHEL'35 as a vice-president and member of the board of directors of the Fargo Motor Corporation was announced on February 23.

WILLIAM B. BERGEN'37 has been elected vice-president-chief engineer of the Glenn L. Martin Company.

## Special Delivery

CALVIN M. BOLSTER'23 spoke on "The Assisted Take-off of Aircraft" at Norwich University on February 8.

A talk entitled, "Sources and Uses of Energy in the United States" was delivered by EDWIN R. GILLILAND'33 on January 10 during the General Electric "Science Forum" program broadcast from Schenectady, N. Y., over Station WGY.

PRESCOTT A. SMITH'35 addressed the

Hartford chapter of the American Society of Tool Engineers on January 8. Professor Smith discussed the "Tool Engineer and Education." He also has been elected chairman of the Boston chapter of the American Society of Tool Engineers.

J. EDWARD VIVIAN'39 was the guest speaker at an M.I.T. luncheon held by Alumni attending the annual convention of the Technical Association of the Pulp and Paper Industry in February.

## Obituary

LONSDALE GREEN'87, January 22.\*  
EDWARD S. HOLMES'90, December 2.  
FRANKLIN W. WHITE'90, December 19.  
MARY P. WINSOR'90, September 1.  
WILLIAM S. FORBES'93, February 2.\*  
CHARLES S. PASTORIUS'93, November 25.  
ELIZABETH S. WATSON'94, April 23, 1948.  
ALLISON OWEN'95, January 31.  
WILLIAM P. ANDERSON'96, February 26.\*  
HENRY CUMMINGS'96, February 2.\*  
LAWRENCE K. SAGER'96, January 28.\*  
FRANK C. HASTINGS'98, April 26, 1948.  
GEORGE E. HOLMES'99, March 23, 1942.  
JENNIE K. McMASTER'00, December 26, 1947.

ALEXANDER PHILLIPS'00, August 9.  
WILLIAM H. WEDLOCK'00, January 3.  
HENRY O. TROWBRIDGE'02, January 28.  
JOHN B. RAPIER'04, January 15, 1931.  
RUSSELL RAY'04, July 21.  
JOHN W. ROLAND'04, November 6.  
ERNEST HARRAH'05, December 24.  
SCOTT C. RUNNELS'05, January 1, 1950.  
GEORGE H. BUCKINGHAM'06, December 18.

ROBERT E. THAYER'07, February 25.  
RAYMOND WARE'07, January 28.  
JOHN T. ELLSWORTH'08, October 26.  
HAROLD I. EATON'09, in January, 1951.  
FRANK S. LOVEWELL'09, February 11.  
THOMAS J. MOORE'09, January 6.  
CLARENCE L. OFENSTEIN'11, January 27.  
WALTER I. PHILLIPS'11, October 3.\*  
WILLSON Y. STAMPER, JR., '11, February 7.  
RALPH T. STONE'12, October 15.\*  
JAMES H. WARD'12, September 2.\*  
HARLAND F. BROWN'14, date unknown.  
RALPH M. EMERSON'14, February 5.  
ROLAND WOODWARD'14, September 22.\*  
ALBERT F. CORNELIUS'15, June 6.\*  
WILLIAM M. BOUKNIGHT'18, December 30, 1945.

DAVID C. SANFORD, JR., '19, December 24.\*

PHILIP W. CLARK'21, February 9.  
JOHN A. FACEY'21, January 15.  
IRA P. JONES'21, March 30, 1949.  
MELVILLE J. MARSHALL'21, date unknown.  
RICHARD W. SEARS, 2D, '21, January 8, 1949.  
RALPH S. DRURY'22, July 23, 1947.  
CHARLES F. SCHUMAKER'22, February 27, 1946.

EARL S. CLARK'23, February 1.  
JAMES R. TIDYMAN'31, February 23.  
ARTHUR J. DONNELLY'48, December 22.

\* Mentioned in class notes.

# News FROM THE Clubs AND Classes

## CLUB NOTES

### M.I.T. Club of Schenectady

Present at the January 16 meeting of the club were the following Alumni: J. B. Taylor'97, P. M. Currier'14, E. H. Bancker'18, B. S. Weaver'25, A. de H. Hoadley'26, J. F. Lucey'29, J. H. Macleod'41, P. J. Joyce'41, R. W. Stanhouse'41, C. F. Olson'41, R. H. Simon'41, R. W. Austin'42, E. B. Judd'42, A. A. Root'43, W. B. Rodemann'44, E. S. Lawrence'47, P. H. Baker'48, E. R. Barriere'49 — EDWIN S. LAWRENCE'47, *Secretary*, Building Number 99, Room 102, General Electric Company, Schenectady 5, N.Y.

### M.I.T. Club of Southern California

The future of this club appears to be very good on many accounts — the 1951 directory list of names went to Severance '38 on February 5 for correction, ads and professional cards are still coming in and contract has been let to the printer. Any alumnus who has not sent in his data and subscription is urged to do so at once. Due to the good work of the Directory Committee, and others, a very good slate of officers were unanimously elected at the annual meeting at the University Club on February 15. The duties have been spread over a much larger number and the names of some well known as good workers in the past will be found.

The first listing will be the Honorary Secretaries for this area who are appointed by the president of the Institute. They serve as local representatives of the Alumni Association and specifically interview and assist prospective students. Dr. Padelord observed that the Scholarship Committee of the local club could be of assistance in locating prospective students of high calibre who would benefit most from M.I.T.'s curriculum. Suggestions for this committee will be greatly welcomed by the new Club President, Golsan'34. The Honorary Secretaries are Kenneth C. Kingsley'23, Ralph B. Atkinson'29 and Charles H. Toll, Jr.'23.

The 1951 club officers are: President: Page E. Golsan, Jr.'34; Vice-presidents: George M. Cunningham'27 and Rockwell Hereford'24; Secretary: Hiram E. Beebe'10; Assistant Secretary: Philip A. Herick'24; Treasurer: William H. MacCallum'24; Assistant Treasurer: Victor Stanley'44. In addition, representatives of classes of five-year groups were elected who, with the officers, form a board of governors who meet monthly. The governors' meetings are also open to all Alumni wishing to present any matters of constructive interest and to any visiting

Alumni. The names of the governors will be in the next notes together with, we hope, the list of the class secretaries. This organization should double the attendance.

Approximately 100 persons listened to the high quality address of Dr. Padelord on international relations. His main point was that our national reserves should always be more than our commitments to other nations. A very active question and answer session followed and many visited socially a longer time. An additional 50 Alumni sent in 1951 dues and expressed regrets for previous commitments.

Among those present were, in addition to the guests of honor, Dr. Padelord of M. I. T., President Lyon and Dr. Jaeger in charge of the combined plan of study between M.I.T. and Pomona College: Clapp'03, Beebe'10, Golsan'12, Schmiedeke'12, Morton'13, Crowell, Gallagher, Mellema, Stringfield'15, Coleman, Dalton, Holmgren, Untersee'19, Chilcott, Homerberg'21, Livadary, McClure, Ramsey'22, Kingsley, Naughten, Powers, Row, Toll'23; Bates, Carothers, Davis, Hereford, Herrick and MacCallum'24; Grantham'25; Geyer and Wood'26; Cunningham'27; Sammis'28; Sammis'29; Hiller and Fischer'31; Boden and Golsan'34; Hakala and Ryan'35; Andreas'37; Strauss and Weir'38; Hutzler and Burr'40; Wyle'41; Johnson'42; Gunlock'43; Robinson and Stanley'44; Dingler and Monroe'48; Lynes, Walton, Marx, Webb'49; Helmich, Holmgren, Willner'50.

San Diego was represented by Dalton'19 and the Holmgren trio, Mr. and Mrs. R. S., '19, and their son, R. S. Jr., '50. There is a prospect of a more active organization in San Diego with a meeting there which will be attended by many from the Los Angeles area. Eighteen of the alumni wives graced the occasion. Two alumna present were Louise Fischer'31 and Constance Sammis'29. Mrs. Sammis is taking advanced work at U.C.L.A. and writing up the prominent women of Southern California. The French Government has made Douglas'14 a member of the Legion of Honor.

Items of interest regarding Alumni will be welcomed by the Secretary and by Strauss'38, the new chairman of publicity. Other chairmen and committee members will appear in next month's notes. — HIRAM E. BEEBE, *Secretary*, 1847 North Wilcox Avenue, Hollywood 28, Calif.

## CLASS NOTES

### • 1887 •

Lonsdale Green'87 died on January 22, 1951, at Fort Meyer, Fla., where he had gone for the winter. He was born at Cincinnati, Ohio, in 1864 and received

his earlier education there. At the Institute, he enrolled in Course IV. His first job after leaving school was with an architectural firm in Cincinnati for approximately a year, and then he spent the next four years as an independent architect in Anniston, Ala. He came to Chicago in 1892 where he made his home until the time of his death. He worked for six years in the architectural firm of Henry Ives Cobb, followed by another six years as chief draftsman for the old Illinois Steel Company. From about 1904 to 1914 he was associated with E. W. Sproul Company, of which he became vice-president. From 1914 to 1920, he was with B. J. Arnold and Company, engineers and contractors, and from 1920 to 1928 was with Battey and Kipp, consulting engineers. He retired in 1928.

He married Nellie Wilder in 1888, and is now survived by three sons — Lonsdale, Jr., of Westfield, N.J.; Donald W., of Minneapolis; and Ralph of Chicago. After his retirement, he became very active in the Ohio Society of Chicago and was editor until the time of his death of the Society's paper, *Buckeye Bulletin*. He was a regular attendant at alumni meetings in Chicago and at his class reunions, including more recently both his 50th and 55th reunion; and even last fall, at the age of 86, turned out for a Chicago alumni dinner in honor of Dr. Compton and Dr. Lewis. The M.I.T. Club of Chicago long will remember Lonsdale Green.

*(The above obituary of the late Lonsdale Green was prepared and kindly sent to The Review by Philip L. Coleman'23, Secretary of The M.I.T. Club of Chicago. Ed.)*

### • 1893 •

William S. Forbes, board chairman and treasurer of the Forbes Lithograph Manufacturing Company, died at his home in Hamilton on February 2. He was president of our Class, 1928-1937, and always has been a generous supporter of all class activities. He also served the Institute as a member of the Corporation for two years, 1931-1933.

Forbes was a member of the Myopia Hunt Club of Hamilton (fox hunting and riding were his hobbies); the Algonquin, Union and Down Town clubs of Boston; and the Newcomen Society. He had been a director of the Lithographers' National Association, the Lithographic Technical Foundation, and the Merchants National Bank of Salem, and a member of the advisory council of the Boston Museum of Fine Arts School.

He is survived by his wife the former Gertrude Potter Fox; a son, William S. Forbes, Jr.; and a daughter (Barbara), Mrs. Forbes Hall of Baltimore. — FREDERIC H. KEYES, *Secretary*, Room 5-213, M.I.T., Cambridge 39, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, 38 Chauncy Street, Boston 11, Mass.



Replies are coming in every mail in answer to our 55th reunion letter. Already the following classmates plan to attend: Henry Hedge, Dan Bates, John Tilley, Charles Trout, Butler Ames, Hattie Gates, Bradley Stoughton, Marshall Leighton, Lewis Breed, and Henry Tozier. We have also heard from these who send their regrets: Louis Freedman, Irving Merrell, Guy Morrill, C. E. Batchelder, and Albert Ruckgaber. They send their greetings to all and wish it were possible to be with us. This shows the interest manifest in our big 55th reunion. Let it be an example to those of you who are planning to make the trip east for this rare occasion, and send in your decision as promptly as possible. Classmates not planning to attend, can be of great assistance to the secretaries if they would send along a report of their activities over the past five years. We are very fortunate in having Harry Baldwin to help in making the plans for this gathering at the New Ocean House, as he is a personal friend of the manager. Charles Gibson has a summer place at Nahant, Mass., and hopes to have open house on Friday the 8th from four to six. He is noted for his famous rose gardens. Try to arrive in time to take advantage of this rare opportunity. It will be an added attraction to our anniversary celebration, especially to those who come from inland and wish to view the beauties of our rugged North Shores.

Your secretaries planned to have a noon dinner with the New York group on February 23 at the Whitehall Club, 17 Battery Place, New York City. Five of the class members attended the mid-winter alumni meeting on February 1. Those present were: Perry Howard, Jim Driscoll, F. T. Rundlet, Fred Damon and John Rockwell. We all enjoyed this get-together.

We have just received word of the death of Henry Cummings. He will be well remembered by the athletic group as a mile runner. His architectural qualities brought him in touch with numerous professional interests, culminating in forming his own company. In later years, he had been retired. Report of his death gave his last residence as Dover, N.H. Henry had spent many hours in the library translating from other languages. He enjoyed the better things on television, had a fine garden and also enjoyed fishing. He was fond of and seemed to know a good deal about animals. Everyone loved him, especially children.

The following paragraph concerning our late classmate, Lawrence Sager, was taken from the New York *Herald Tribune*: "Born in Boston, Mr. Sager received an engineering degree from . . . Technology in 1896 and the degree of Master of Patent Law from Georgetown University Law School in 1903. From 1899 to 1900 he was with the United States Patent Office, where he worked on the design and construction of an improved heating and lighting system for the Patent Office. He was a member of the Bankers Club, Machinery Club, New York Patent Law Association and the Institute of Electrical Engineers. His

wife, Mrs. Mary Phillips Sager, survives." Mrs. Sager has written to the Secretary: "I wish to thank you, as well as Mr. Damon and the members of the M.I.T. group of the Class of '96, for the sympathy extended me. It was kind of you to have wished to have attended the services — I should have liked so much to have seen you. So many spoke of how serene and how peaceful Lawrence looked — just as though he were asleep. He was not thin, although he had been ill for almost four months. I thank you for the lovely flowers. If only Lawrence could have seen them, he was a lover of flowers."

We deeply regret to note the death of William P. Anderson on February 26 and hope to have more details of Bill's life in a later column. The following appeared in the Boston *Herald* of February 27 listed under "Other Deaths": "In Cincinnati, William Pope Anderson, 76, retired founder of the Fero Construction Company and pioneer in the field of reinforced concrete construction."

Changes of address: William H. McAlpine, Office, Chief of Engineers, U.S.A., Room 2303, Building T.7, Washington 25, D.C.; Edward L. Sturtevant, 2829-27th Street, N.W., Washington, D.C. — JOHN A. ROCKWELL, Secretary, 24 Garden Street, Cambridge, Mass. FREDERICK W. DAMON, Assistant Secretary, 275 Broadway, Arlington, Mass.

• 1899 •

Just as the deadline for this issue had almost been reached came the news that Professor Emeritus Miles S. Sherrill was seriously injured in an automobile accident on December 28. He suffered a broken hip, a cracked pelvis and a broken jaw. At this writing both the hip and the pelvis are progressing favorably according to the Assistant Secretary, but until the wire is removed from his jaw, Miles will be unable to open his mouth. He is still at the Phillips House of the Massachusetts General Hospital in Boston; but by the time this story is read, he will probably be back to 1060 Beacon Street, Brookline. Both Richmond and Skinner have visited him. He would be glad to see or hear from classmates.

Frederick Waddell of the Bethlehem Steel Corporation was a recent visitor in Boston and is said to be looking the picture of health. — BURT R. RICKARDS, Secretary, 381 State Street, Albany, N.Y. MILES S. RICHMOND, Assistant Secretary, 201 Devonshire Street, Boston, Mass.

• 1911 •

With deep regret we note the passing on October 3, 1950, of Walter Phillips, VI, long-time employee of the New England Telephone and Telegraph Company in the Greater Boston area before his retirement in mid-summer last year. Walter had gone to Presque Isle, Maine, in an effort to regain health but early in the fall a heart attack soon proved fatal. For many years he had made his home in the Coolidge Corner section of Brookline and seldom missed attending our annual "Seven Come Eleven" class dinner each November 7 at Walker Memorial, nor had he once missed supporting

the M.I.T. Alumni Fund since its establishment 11 years ago. We have lost a fine classmate.

Announcement was made from Paterson, N.J., on January 31 that "following many weeks of discussion Mr. D. R. Stevens (II) has signified his intention to retire from active participation in all Okonite operations, the consideration being the insurance of his continued good health after 30 years of loyal and constructive service with Okonite." This, I know, proves welcome news to those of us who know and love Don best, for he has been very loathe to "put aside the armor," but this decision of his is eminently wise and should measurably improve his health and lengthen his life. The announcement, signed by A. F. Metz, President of the Okonite Company, continued: "Mr. Stevens entered the company in 1921 at the crucial period of our history and played an important part in developing an organization that we now view with pride as an example of cooperative strength. It is not easy to terminate such an outstanding record and so it is with the greatest regret that I am accepting Mr. Stevens' resignation from active participation in operations as of January 31st. He is continuing as a Director. He will be called upon as often as we have occasion to benefit from his advice and experience and will retain his title, Executive Vice President, until December 31st, 1951." We are all proud of your accomplishments, Don, and we hope in retirement you find rich rewards in joy and improved health!

Once again there was an even dozen '11 men at the February first midwinter alumni meeting at Walker Memorial, when Marshall B. Dalton '15, Chairman of the M.I.T. Committee on Financing Development, announced that the \$20,-000,000 Development Fund, inaugurated in 1949, had gone "over the top" by \$100,000 not including the \$5,250,000 Sloan grant for a new School of Industrial Management. Following custom, your Secretary led the songs and cheers at this enthusiastic alumni meeting and other classmates present included Obie Clark, II; Marshall Comstock, VI; George Cummings, VI; Henry Dolliver, I; Fred Harrington, I; Charlie Linehan, I; Carl Richmond, I; O. W. Stewart, I; Emmons Whitcomb, X; Al Wilson, I; and Reunion Chairman Aleck Yereance, I. Al Wilson was accompanied by two of his sons — A. O., Jr., M.I.T.'38 and Don, Harvard '42. Course I was way out in front with seven men present, three from Course VI and one each from II and X. Most of those present plan to be at Snow Inn, Harwichport, on Cape Cod, for our 40th reunion June 8 through 10 and back to Cambridge and Boston for Alumni Day, Monday, June 11.

"It's easy to sell properties leased to nationally-known chain stores, according to Frank Russell of the George M. Horn Co., New York City brokers, but the trick is to find one that offers not only absolute investment safety but also a good return and the prospect of still being in a prime neighborhood in another 20 years or more." So begins a story captioned: "Broker Extolls Small-Town 'Chain' Realty" in the January 5 New



York Herald Tribune. Our own Pat Russell, II, here sounds a warning to "beware the old-style 25x100-foot store which cannot produce the necessary volume of sales," adding that a week ago he had completed what he considered an ideal investment sale in a small North Dakota community.

In Washington in early February, House monopoly investigators criticized government sale of stockpile aluminum to private companies at less than cost. I. W. Wilson, XIV, senior vice-president of the Aluminum Company of America, told the committee that Alcoa bought 225,000,000 pounds of aluminum from the stockpile during 1946-1948 at the market price of 14 cents, adding that he understood the government had paid as high as 17 cents for some of it. Alcoa then sold it to fabricators, Bun said, at the same price paid the government, so "undoubtedly the government lost on the deal."

"Let the Helicopter Protect Your Crops and Increase Your Yield" shrieks a blue and white flyer put out by the recently formed Eastern States Helicopter Service, Inc., 2 John Street, Post Office Box 255, Providence, R.I., whose enterprising founder and president is Burleigh Cheney, II. He has had an experimental station underway for some time, known as Whirl-I-Gig Farm in Duxbury, Mass., and claims "a new Time, Labor and Money saving service is now available to the farmer and grower for pest and disease control, for the helicopter's ability to fly forward, backward, sideways or stand still in mid-air, provides the effective way to dust or spray crops and orchards."

Other advantages claimed by Burleigh for the helicopter on the farm include: speed of application, uniform coverage, rotor downwash, complete coverage, less waste and operation in adverse weather plus safety at night. Here, the man says, is a safe, proven, economical and practical method of producing and applying fog, spray and dust, as needed, on the farm.

From Detroit Joe French, IV, of Albert Kahn and Associates, architects, writes that he and his wife, Yolanda, are looking forward to reunion attendance in June, adding: "We are being pushed and crowded with war contracts again, the same as in the two previous war efforts. In general, the country seems to be in far better shape than we ever were before — so records will doubtless be surpassed within a year."

Lester Cushman, IV, now with Burns and Roe, Inc., engineering consultants, 233 Broadway, New York 7, is hoping desperately that he and Hazel can attend the reunion, but says he frankly does not feel "anywhere near as well at the moment as I did a year ago, nor does Hazel, but we're both trying hard to get into the health groove, as 'twere." Cush says that he has a particularly interesting assignment right now — a training program for employees at the Danskammer Point Station of the Central Hudson Gas and Electric Corporation at Poughkeepsie. — Another classmate stating chances are fair that he'll attend our June reunion is Warren Hopkins, VI, retired Stone and Webster executive, now spending the winter in San Diego, Calif., with Mrs. Hopkins, but due back at their Marblehead Neck home

here in Massachusetts in the spring. Suren Stevens, IV, also with Stone and Webster, says he and his wife must pass the reunion up this year. But Bog adds: "May the warm sun shine on the three days of the reunion and we'll see you all five years hence."

Well, sir, eleven more '11 men have sent in class dues and two of them — Obie Clark, II, and Chet Pepper, II — plan to attend the reunion with their wives. Chances are fair for three doubles — Charlie McManus, I, Beverly; Walter Wilson, X, Lawrence; Morell Mackenzie, II, Providence; and for three stags — Stan Lawton, V, Boston; John Alter, IV, Lawrence; Harry Manley, I, New York. Bog Stevens, IV, Boston; Harold Shaw, II, Leominster; and Lester Cushman, IV, New York, fear their chances are poor. Summing up, we have at this mid-February writing 45 classmates, involving 78 persons, planning to attend; 58 for 85, chances fair; and 44 with poor chance of attendance, or a total of 147 replies.

We plan to issue an edition of *The Eleven* in early March and Reunion Chairman Aleck Yereance urges everyone to make every effort to get to Snow Inn at Harwichport, on Cape Cod, for as much as you can of the June 8-10 week end and then attend Alumni Day on Monday, June 11, at the Institute. See you there! — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Gardner, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

## • 1912 •

It is with deep regret that we note the death of James H. Ward, X, of Natchez, Miss., on September 2. Also regret the passing of Ralph T. Stone of Ardsley, Pa., on October 15.

Congratulations are in order to Edmund B. Moore, VI, on his engagement to Marion Underwood of 29 Palms, Calif. Colonel Moore, who is now residing in Joshua Tree, Calif., is a retired Army officer.

Johnny Noyes, while attending an A.P.I. meeting in Los Angeles, had a pleasant luncheon at the Jonathan Club with Bill Lynch, Henry Babcock, Page Golsan and Herbert Calvin. Bill Lynch is still with the Aluminum Company. Henry Babcock is doing construction engineering in connection with the Los Angeles transit problem. Calvin is in building construction work. Page Golsan, Vice-president of Ford, Bacon and Davis is very active on West Coast development.

Your Secretary enjoyed a very pleasant visit with Johnny Noyes when he was in Boston for a Unitarian Board Meeting, as he dropped in for Sunday breakfast and gave a very interesting review of his many travels. — As you may have noticed, 1912 class notes have been very few and far between. Won't you personally do something about it by writing to your Secretary or Assistant Secretary? — FREDERICK J. SHEPARD, JR., *Secretary*, 31 Chestnut Street, Boston 8, Mass. LESTER M. WHITE, *Assistant Secretary*, 4520 Lewiston Road, Niagara Falls, N. Y.

## • 1914 •

The annual Boston midwinter Technology dinner was held at Walker Memorial

on the evening of February first. In spite of most inclement weather, a capacity crowd sat down to a fine steak dinner and later heard Marshall Dalton announce that the twenty-million-dollar campaign had gone over the top exclusive of the generous Sloan gift. Classmates attending were Crocker, Phil Morrill, Hamilton, General Joe Ward, and your Secretary. A telephone call revealed that Petts and Scannell had made a brave start, but had become lost somewhere in the storm.

Word has been received that the ranks of '14 have been depleted by the loss of another classmate. Roland Woodward, Course II, died on September 22 last. Woodward came to the Institute from Jacksonville, Fla., having prepared at the Duval High School and first stopping at Georgia School of Technology. On May 17, 1924, he married Eleanor Spear who, with a son and two daughters, survives him. He had spent his entire business existence with the Atlas Powder Company of Wilmington, Del. — Your Secretary has learned of the death in early February of Charlie Fiske's mother at Auburndale, Mass. The sympathy of the Class is extended to you, Charles.

Tatsuo Furuichi, ex-Admiral of the Japanese Navy, writes of a meeting of the M.I.T. Club of Japan held on December 9. In part he says, "We had a pleasant and joyful time in the afternoon, having American beer and some of American food which made me recollect my happy days while I was in America." Admiral Furuichi also tells about Samuel E. Duff, a Navy lieutenant and son of Levi Bird Duff who is stationed in Japan as the chief of a transfer base. Your Secretary sent this information on to Duff, who is director of the County Department of Works, County of Allegheny, Pennsylvania, and received the following reply:

"It was most interesting to receive your letter of January 31, 1951, regarding former Admiral Tatsuo Furuichi and my son, Samuel E. Duff, who by the way graduated from Course I in the Class of June, '45 and was immediately commissioned in the Civil Engineering Corps of the Navy. I think this all started by a clipping from *The Review*, which Mrs. Duff sent to Sam. The friend of Admiral Furuichi, I believe, is a former Rear Admiral who is working at the same base. You might be interested to know that about three weeks ago, the remainder of my family, from three separate locations in this country, on a conference hookup talked to Sam at his present station. He was very fine and very busy." — H. B. RICHMOND, *Secretary*, 275 Massachusetts Avenue, Cambridge 39, Mass. ROSS H. DICKSON, *Assistant Secretary*, 126 Morristown Road, Elizabeth 3, N.J.

## • 1915 •

With his fight and determination, our popular classmate, Gene Place, has come a long way in his recuperation. Several of the fellows have seen him and all report him vastly improved and in fine spirits. Gene's letter is the best way to tell you how much your solicitations have helped him: "During the past few weeks I have had plenty of time to cogitate on life in general and in particular, the past, present

and the future — what good times we of 1915 have had since we entered Technology; how much we have enjoyed being together; how close we have become, at our various get-togethers, dinners, reunions and chance meetings — each one is more and more enjoyable. I really believe 1915 is one of the most closely knitted classes, and the present seems to provide opportunity for strengthening our bonds of friendship and brotherhood. The future will bind us closer and closer. My recent illness has made me realize that the past has furnished us an unbreakable bond. Certainly the members of our Class have showered me with innumerable thoughtful letters, telephone calls, and messages of all kinds. My classmates will never know how much they have helped in my recovery, and I am indeed grateful. I hope to have the opportunity to thank each one personally before very long." Keep up your good work and give Gene a cheering message occasionally.

It really looks as though we've lost the handsome Bill Campbell from our midst but the '15 men on the Coast will gain. Congratulations to Bill with our sincere wishes for every happiness and success in his new work. From *Packaging Parade* of January, 1951: "Prof. William L. Campbell, head of the Food Technology Department of . . . Technology, has been elected a vice-president of Food Machinery & Chemical Corporation. He will assume executive staff duties at the company's home office in San Jose, Calif. He has an extensive background in the food industry, including important executive posts with Kroeger Grocery & Baking Company."

The fine time Hen Berg had at our reunion is helping him to make up for these long years of silence. Write any time, Hen, we're always glad and interested to hear from you: "I read our class notes with interest. We had Lobby here just after the New Year. He spoke to a turnout of 47 persons at the University Club describing the current M.I.T. picture with his usual humorous and easygoing manner. He was heading for Los Angeles (from San Francisco). I was sorry to hear about Gene Place but his recovery is gratifying."

How these retired '15 men must suffer. From West Palm Beach, Jim Tobey writes that he's been there for a month since the middle of January, but "will soon have to shove off for the frigid north." Watch out, Colonel, the draft may chill you down. — By the time you've read this column you who attended our famous reunion at Coonamessett in June will have received the last of the "loot." Jac Sindler has sent you the pretty red plastic ice bowl with the official M.I.T. seal in the bottom. Many thanks to Jac. And, incidentally, Ben Neal did a great job heading that "loot" committee.

Elmer Waters is in circulation around Boston. He has charge of outside property for the New England Telephone and Telegraph Company in their southern New England district. He and Henry Sheils were seen by my "spies" furtively easing themselves out of the Harvard Club in Boston one day about 3:00 P.M. Must have been a nice lunch. You never can tell what those two are up to!

Dr. Albert F. Cornelius, Crescent Drive,

Berea, Ky., died on June 6, 1950. We have no other details.

Keep wishing Gene well and you'll help all around. — AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline 46, Mass.

## • 1916 •

PLAY BALL! The old familiar cry will be resounding throughout the nation within the next few days, quickly followed by the sounds of the crack of the bat, the smack of the ball as it slams into the fielder's glove, the enthusiastic yells of the fans in the stands, the continuous chatter of the players as they shout encouragement to their teammates, and oh yes, the click of the knob and the scrape of a chair against the floor as we turn on the television set and move our seat into a choice location. This last item is certainly a far cry from the good old days. Now all they have to do is figure out a way to make it possible for the television audience to scramble for the ball as it is fouled off by the batter.

Mail is still coming in very nicely. We'll start right in with a letter from Harold Saunders in which he writes as follows: "Replying to your letter of 29 January, requesting up-to-date news of our activities, it so happens that I do not have much to add to what I wrote you the last time. I still keep up my small sailboat racing activities, to the point of serving as the commodore of the National One-Design Racing Association for 1950 and 1951. We are still winning trophies although I must admit that the credit for them goes to my two sons, David and Roger. It may be of interest to others in the Class to say that I was awarded an Honorary Doctor of Science degree by the Stevens Institute of Technology in June of last year. I am due to make a trip to New England some time this year but whether I can make it for the 35th reunion in June, I cannot tell at this time." Nice to hear from you, Harold; we're counting on you to arrange your schedule so that you will be with us at the reunion.

Dick Rowlett writes an interesting letter: "As much as I dislike personal publicity, I cannot refuse your appeal of January 29. I will give it to you briefly without embellishments. I live at 23 The Waterway, Manhasset, N.Y. I am responsible for the Eastern destinies of the Brown-Bridge Mills, Inc., of Troy, Ohio, who manufacture gummed paper and cloth, supplying the corrugated box, electronic, printing, and general paper industries. My New York office is at 6 East 45th Street, and the latchstring is always out. My son, Tom, a Pursuit pilot of World War II, is married and connected with the Chicago office of my company. My older daughter, Caroline, is married to a Navy Ensign whose Destroyer is at present based at Newport, R.I. My younger daughter, Jane, is a sophomore at the Maryland College for Women. I am in excellent health and in training for the 35th reunion during which I hope to be able to keep up with you at the Merry-Go-Round Bar or wherever else we should attach ourselves. My wife, Helen, has dubious recollections of our performance 10 years ago, but I think that if my exemplary conduct of the past few weeks

continues I will get a reprieve that will permit me to cross elbows with you in June." What's this training program you refer to, Dick; perhaps you could send us an itemized listing of the "do's" and "don'ts" in your program which we could publish in the column and thus make it possible for all of us to report on opening day in tip-top condition.

From Sumter, S.C., Lyman Quincy, writes: "Since my last report I have continued to live in Sumter, S.C. I am still engaged in the manufacture of paint, varnish, and finishing materials. World War II kept me busy since we converted our plant to make special coatings for the Armed Forces. After the war we expanded greatly and improved our furniture finishes and other materials for civilian use. Now we are back on war production again. My eldest daughter, Antoinette Lyman, married a South Carolinian, Thomas Henry Siddall, III. He is a graduate of the University of North Carolina and has an M.A. from the University of Chicago and a Ph.D. from Duke in chemistry. They have three little girls, Antoinette Quincy, Elizabeth Charles and Jane Van Cleve. My younger, Mary Van Cleve, went to Converse College for two years and was graduated from the University of South Carolina. She studied art for a year in Richmond, Va., and is now at home with us in Sumter. In line with my work I am interested in research in the chemistry and technology of the use of wood waste. I enjoy the good hunting and fishing we have down here and I spend a lot of time looking after a flock of chickens which produce eggs costing about a quarter apiece. Sumter is about half way between New York and Miami on Route 15 which, according to the Chamber of Commerce, is the shortest route from North to South. I would be happy indeed to see any member of the Class who might be driving through on the way to Florida. Still have hopes but don't believe I'll make the 35th, too busy." Too much business is not good for any man, Lyman, and it would seem that a "quiet" week end early in June with some of your old classmates would be just the tonic needed to keep you from being overworked and becoming stale. We'll not only guarantee you a wonderful week end, but will also guarantee that when you return to your business routine your judgments will be much sharper as a result of this change of scenery. We'll be saving a spot for you, Lyman.

Howard Smith brings us up-to-date with this one: "I had hoped, after going through two hectic wars, to live the rest of my life in peace, and no overtime. But alas! as a submarine design engineer, I find myself now working nine hours per day, six days a week. On top of that, it just seems impossible to get the right kind of men: The kind who can work out the problems on their own. I may yet have to die with my boots on. I should have visited a fortune-teller last fall, as, expecting the Korean situation to clear up shortly and not getting any younger, I ordered a Motor Sailer to be built from one of my designs. My three children are now happily married and we have five grandchildren." There are many others, like



yourself, Howard, who are being pressed into full-scale service as a result of this current world situation. The only advice we can give to you and the others is to make sure that you take in the 35th reunion. If nothing else is done, at least it will give you a chance to get your second wind.

We just had word from Harvey Jackson who sent us what he called a purely statistical report. He is now associate architect in the State Architect's office in Albany. From 1916 to 1920 he was on drafting work in offices in Buffalo and Detroit, and during World War I with the Bureau of Aircraft production in Washington. He then practiced architecture on his own at Grand Rapids, Mich., until 1924. Subsequently, was a designer in Rochester. From 1927 to date he has been with the State Architect's office in Albany. He married Flora J. Anderson of Dunkirk, N.Y., in 1920 and has two children, a son, Richard, Lieutenant, j.g., Naval Air during World War II, M.E. in aeronautics, Syracuse University 1949; and a daughter, Ellen, who is a senior at Keuka College. This summarizes his information which he stated was all that time would allow if he was to meet the deadline that we had spoken to him about.

And in the same mail with Harvey's letter was one from Charlie Glann. The two boys see each other practically every day, it seems. Charlie says: "Here goes. After World War I, I was with the Vacuum Oil Company, S.A.F. — Paris, returning to the U.S.A. at the beginning of 1938. During World War II, I was with the General Electric Company, Schenectady, N.Y. — Turbine Department. For the past five years I have been Assistant Building Electrical Engineer. — Department of Public Works of New York State. Of our classmates, I see Harvey Jackson nearly every day and work in harmony (not singing) with him on many buildings now under construction in N.Y. State. Should mention that since my return from France and death of my first wife, I have remarried. We now have two sons in the service, one in the Navy and one in the Signal Corps."

In the Sunday New York *Times* of January 21, Steve Brophy was again in the news. A picture shows him with two others under a U.S.O. banner with the caption "The U.S.O. Back on the City's Home Front." The *Times'* article reads as follows: "Plans for the United Service Organizations' New York campaign, the first in a national fund-raising program for 1951, were announced yesterday by Alexander I. Henderson, campaign chairman and former head of the Associated Services for the Armed Forces. At a meeting at Campaign headquarters, 50 Broad St., Mr. Henderson named two co-chairmen. They are Thomas D'Arcy Brophy, chairman of Kenyon and Eckhardt, Inc., and president of the American Heritage Foundation, who was U.S.O. publicity chairman in World War II, and Carl M. Loeb, Jr., vice president of the Climax Molybdenum Company and of the National Jewish Welfare Board."

Marshall Root comes across with: "If you insist! I am chief engineer at the

American Wringer Company, Inc., in Woonsocket, R.I. I have charge of the Engineering Department and of the Maintenance. I am still single! My main hobby is work and play with boys and young men at the Woonsocket Y.M.C.A. Believe it or not, I still play tennis and basketball, admittedly of a slow variety."

Here's a long and interesting article which appeared in the Boston papers not so long ago and having reference to one of our more renowned classmates: "It was beyond the wildest dreams of a poor boy like me and was probably the only time in my life when I was completely free of financial responsibilities." The speaker? Isidor Richmond, prominent Boston architect. The 'it'? Not the mysterious subject of a song, but the Rotch Traveling Scholarship . . . the first foreign travel fund in America, most highly prized by architects, which was won by Mr. Richmond in 1923 and by his partner, Carney Goldberg, in 1931. Mr. Richmond is chairman of the 'Rotch in Retrospect' exhibit which opens Wednesday for two weeks on the 26th observation floor of the John Hancock Bldg. during regular visiting hours. It will include the work, in models, photographs and drawings of Rotch winners through the years. And that means many of America's most noted architects; all of whom — as a condition of the scholarship — received their training in Mass. 'If I hadn't won the Rotch,' said Richmond modestly, 'I'd probably still be only an obscure draftsman in some architect's office. It gave me prestige as well as learning.' With a tanned complexion, keen dark eyes and wavy grizzled hair, he smiled as he reminisced about his good fortune. Born and brought up in Beachmont, he went to Revere High School, but was not able to go on to college or a graduate architectural school. So he got a job in the office of famous architect, Ralph Adams Cram, and entered classes at the Boston Architectural Center. There he received the best of training, with teachers from Harvard, M.I.T. and practicing architects. 'The daytime job and night study were an invaluable combination,' he said. 'For one thing, I didn't have time to run around and spend money. I took home my salary for my mother to save toward a graduate course at Tech. (Which he qualified for in the third of a five-year course.) But the Rotch was the objective of every student, and excitement ran high when the drawings were lining up for the competition. There were rooters for every architectural office, and as much discussion as among World Series' fans. Cram gave me added incentive by saying that he expected me to win it.'" Skipping over now to the conclusion of the article we find that Izzie was quoted as saying: "I can thank the training received through the Rotch fund for most of this (the scholarship carries with it a stipend of \$3,000 for a year or more of travel in Europe for an American under 30). Probably Benjamin S. Rotch, the generous founder in 1883, had no idea how much talent his gift would discover and bring into the Bay State. His daughter, the late Mrs. Horatio Lamb, in whose memory the exhibit is being held, carried on the fund with the same liberal terms.

And her daughters, in turn, the Misses Aimee and Rosamond Lamb, are continuing it."

Mrs. Louise J. Peet recently wrote that she would like to be removed from the Class Roster inasmuch as she had only attended one course for one semester at Technology and had always directed her loyalties to Wellesley where she had received most of her training. We have complied with her request.

There had been a great deal of demand for a continuation of the monthly luncheon meetings for the members of the Class in the Greater Boston Area, so we scheduled one for February 13, and will continue to have one on the second Tuesday of every month from 12:30 to 2:30 at the Parker House in Boston. We didn't get our notices out very early and as a result made it impossible for many who wanted to come to be present because they had made previous plans. Nevertheless, we had a very enthusiastic group present in Dick Hunneman, Nat Warsaw, Tom Berrigan, Izzy Richmond, Harold Russell, Allen Giles and your Secretary. We were quite pleasantly surprised when Steve Brophy dropped in and chatted for a few minutes before hustling off to keep an appointment with Dr. Killian. We spent a great deal of our time discussing the plans for the 35th reunion and all were quite enthused at the prospects of the coming event. In addition to those of us who attended the luncheon, Jim Merritt, Jack Burbank, Mark Lemmon, Jack Camp, Jay Sindler, Earl Hauman, Kem Dean, Jap Carr, Irv. McDaniel, Sam Lapham and Dina Coleman have indicated their intention to attend. Then, not too long ago, your Secretary enjoyed the pleasure of having luncheon in New York City with Bill Farthing, Steve Brophy, Walt Binger, Bill Barrett and Harold Dodge, at which time reunion plans were given a thorough going-over, and all present signified that they were going to be among the happy gathering on this festive occasion.

At the time of our writing this column, we had not received the returns from our first class-wide mailing in which we asked each member of the Class whether or not he intended to attend the reunion, but we have every confidence that the attendance is going to be heavy. We're hoping that many of you will be bringing your wives to the cocktail party on Monday afternoon at the Copley Plaza Hotel in Boston. We have a couple of very pleasant surprises in store for the ladies. We are also going to have a few surprises for the men while they are on the Cape, one of which will be the passing out of "loot" to everyone. The committee on "loot" is headed by Bill Farthing and he would appreciate hearing from any and all who, having the facilities, would be willing to make some little knickknacks, trinkets, and so on. These articles should be sent express prepaid to the Coonamessett Ranch Inn, North Falmouth, Mass., in care of the Class of 1916 — M.I.T., shortly before the dates of the reunion. We think it would be quite appropriate if when making these little items the cardinal and gray colors are used. Those of you who are in a position to tackle something like



this, should drop Bill a line (his current address is 10 East 40th Street, New York, N.Y.)

Before closing, we would like to remind all of you of the part that your letters play in making this column interesting, and request that you continue to write to us. Also, be sure to come to the reunion. It will be a source of fond memories in the years to come. Finally, if any of you are in Boston on any second Tuesday of the month, plan to attend the luncheon at the Parker House. — RALPH A. FLETCHER, *Secretary*, Post Office Box 71, West Chelmsford, Mass. HAROLD F. DODGE, *Assistant Secretary*, Bell Telephone Laboratories, 463 West Street, New York, N.Y.

## • 1917 •

Stan Dunning advises that plans for our 35th reunion are being started. Reactions at the time of our 30th, held at Wentworth-by-the-Sea, Portsmouth, N.H., and a reviewing of that place for our next one with some of the local and New York Alumni, indicate that we could do no better than meet there again. Tentative plans are being made. An assistant treasurer will be named soon to work with Joe Littlefield, Treasurer for the reunion. There will be a request forthcoming for a \$5 donation to the treasury to float the reunion preliminaries. A program committee chairman will also be appointed. The dates are June 6, 7 and 8, 1952, so mark them down now!

Ros Senter writes from Dallas, Texas: "Our 35th reunion next year seems a long way off in view of the uncertainties of possible war and other complications; however, if I can possibly make it, I hope to be with you at that time." We hope to have a grand get-together!

Leo Dana was recently appointed vice-president in charge of research of Linde Air Products, a division of Union Carbide and Carbon Corporation.

Bill Mehaffey writes of his recent activities: "I went with the J. E. Greiner Company of Baltimore, Md., consulting engineers, shortly after getting out of the Navy, and in the latter part of 1948 they sent me to Harrisburg, Pa., to represent them in their work as consulting engineers for the Pennsylvania Turnpike Commission. As you probably know, we completed a hundred miles of the turnpike from a point near Harrisburg to a point near Philadelphia last fall and are now building the western extension from near Pittsburgh at Irwin to the Ohio line." — Erling Stockmann has moved from New York City to Great Neck, Long Island.

A few members of the Class went to Ray Stevens' apartment for cocktails before the midwinter meeting. Ted Bernard and Ed Tuttle joined the group at Ray's but could not attend the meeting. The steak dinner was most enjoyable and the Class sat together at two tables. Among those present were: Larry Gardner, Stan Dunning, Kit Cochrane, Tubby Strout, Lobby, Stan Lane, Harold Chisholm, Irv Crosby, Al Chase, Ken Childs, Bruce Davis, Stuart Gurney, Walter Wood, Harold Knapp. Al Lunn's son sat with us. Al, our honored classmate, did a beautiful

job in directing the program. — RAYMOND STEVENS, *Secretary*, 30 Memorial Drive, Cambridge 42, Mass. FREDERICK BERNARD, *Assistant Secretary*, 24 Federal Street, Boston 10, Mass.

## • 1919 •

Lieutenant Colonel William H. Bassett is on assignment with the Procurement Section of the Japan Logistical Command, with headquarters in Yokohama. During World War II, Colonel Bassett was chief of the ammunition branch, Industrial Division, Springfield, Mass., Ordnance Procurement District and also served in the Office of the Chief of Ordnance, Department of Army, Washington, D.C., where most of his time was devoted to the development of improvements in complete rounds of ammunition. In recognition of his wartime services, he was awarded the Army Commendation Medal for meritorious service; a citation from the Commanding General, Army Services, Forces; also the Third Army's Certificate of Achievement. His wife, Mrs. Helen D. Bassett and their son (who is completing his studies at Columbia University) now reside in Scarsdale, N.Y. Their three children reside as follows: William H. Bassett, III, at Winchester House, Fort Hill Village, Scarsdale; Mrs. Louise B. Rugg, 39 Orchard Street, Greenfield, Mass.; and Dean W. Bassett, 45 Popham Road, Scarsdale.

Our classmate, Paul (Mayor) Blye reports that he visited his son, Dick, Class of '54, up at Technology and that somehow or other life seemed much more complicated than in our day there. He is still grinding away at Bell Labs where he frequently sees several of our classmates.

George A. Irwin is the proud granddad of seven grandchildren. Besides maintaining a business at Springfield, Vt., known as the Irwin Pontiac, Inc., he is president and treasurer of the Irwin Motors, Inc., at Claremont, N.H., with a turnover in Pontiac cars and International Trucks.

A very interesting article appeared in the February 11th issue of the New York Times about our classmate, Harry A. Kuljian. He has invented a revolutionary machine for the spinning of rayon, a device very important to the billion-dollar rayon industry. His organization, of world-wide scope and diversified activities in the field of industrial research and engineering, may be classified among the "big six" in the field. The main office of his company is in the old Widener mansion in Philadelphia.

George C. McCarten dropped in for a visit to 385 Madison Avenue recently. He has been very successful with his business in Cleveland and was having a vacation trip. He is looking forward to our 35th reunion and volunteered to help make it the big success the 25th and 30th were. His best regards were left for the Class.

We congratulate John W. Meader on his appointment as assistant treasurer of the Great Lakes Carbon Corporation, at 18 East 48th Street, New York 17, N.Y. W. Barrington Miller is now in the Farming Industry and his new address is at Burgess, S.C. Lots of luck in your new enterprise! J. D. Moore writes that he is still selling cotton yarn — mostly for government requirements at the present time.

Joe Newell passed along the following news recently. Still busy but will be busier than ever if Uncle Sam recalls a number of the staff who are in the reserve lot and, if he calls up enough students to compensate for possible reduction in staff, the Aero Department will have a complete change-over. The new Metals Lab is going up at the end of the Aero Building so now you'll be able to see where some of your Development Fund contribution has gone — if you are up that way next June. His oldest boy, a veteran, is working at Bell Aircraft and his daughter is working for an architect in Lincoln, Mass. His two youngest boys, one at R.P.I. and one at B.U. are awaiting the pleasure of the draft board. He had hoped to see Marshall Lee but the meteorologists in his vicinity were getting in practice for their meeting in New York and they made driving impossible. However, he talked to him on the phone and he sounded as energetic as ever. He sees Jim Holt, Carl Svenson, Fred Spooner and a few of the other '19 men quite often; but having missed the last couple of mid-winter parties, he hasn't been able to renew old acquaintances. He had to forego the 30th to attend his daughter's graduation from Smith; but is in hopes of making the 35th — when it comes around. He is keeping his fingers crossed that we won't have gas rationing by then.

A recent note from Clarence L. Nutting relates that he is still with the William Whitman Company, Arlington Mills Division, in Lawrence, Mass., trying to help make good worsted underwear and dress goods fabrics. His son, Leighton, now 31, was probably one of the first class babies. He attained his Ph.D. degree in bacteriology from V.P.I. having done his thesis work at the Atomic Energy Institute in Oak Ridge, Tenn. He is the proud father of a daughter, Susan — age five, and a son, Michael — age two. Clarence remarked that this really makes him realize how long we have been out of M.I.T.

It is with regret that we learned of the passing of our classmate, David C. Sanford, Jr. He was associated with Edgar L. Williams and a member of the American Institute of Architects. Surviving are his wife and two sons, Timothy and David C., 3d. We extend our deep sympathy to the members of his family.

Your Secretary had lunch with Don Way and talked to Otto Muller — all on class business. — E. R. SMOLEY, *Secretary*, The Lummus Company, 385 Madison Avenue, New York 17, N.Y.

## • 1920 •

The Class had a good representative turnout at the M.I.T. midwinter meeting at Walker Memorial in February. Among those present were the following: El Wason, Jack Lynch, Phil Wait, Harold Bibber, Howard Williams, Perc Bugbee, Joe Hennessey, John Nalle, Scott Carpenter, Carl Leander.

Clara McWhirk has moved from Warrensburg, Miss., to Douglas, Ariz. Colonel Edmund Sullivan is in Atlanta, Ga., address 802 Clemon Drive. Charles Klingler is in Milwaukee, address 1745 West Dean Road.

Your Secretary hoped to get in touch with Skeets Brown or Clarence Syner dur-

ing a recent flying trip to Mexico City. Brown and Syner are both with the American Smelting and Refining Company, with headquarters at El Paso and Chihuahua, respectively. However, the opportunity did not arise. We surely would like to hear from these fellows. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

## • 1921 •

A mere two months hence, well over 100 members of the Class will gather at the special facilities provided by the Sheldon House at Pine Orchard, Conn., to enjoy the three-day celebration of our 30th anniversary, June 8 through 10, followed by a visit to Cambridge for the Alumni Day events and our annual class party, to be held at the Copley Plaza on the afternoon of Monday, June 11. You now have the third reunion mailing from your reunion committee, with the all-important registration and reservation card. It should be mailed back at once to insure that there will be a spot held for you and that you will receive further mailings regarding the reunion. Don't wait. Mail the reservation request today.

Answers to the second reunion mailing are continuing to pour in and the total count of probable attendees at this early date of writing these notes is 105. Your class officers and the reunion committee want to express sincere thanks for the large number of fine responses to the request for information listed on the questionnaire and also for the many contributions to the class treasury, which will aid in keeping us solvent without the necessity for dues or annual appeals. If you have not sent in the completed questionnaire by now, please do so regardless of whether or not you will attend the reunion. If by any chance, you do not receive the mailings or have mislaid the information sheet, please notify your Secretary at the address below and duplicates will be mailed promptly.

Measured in terms of the activities of your reunion committee, the June party will be an outstanding success. Chairman Irv Jakobson is continually cracking the whip. Besides much correspondence and considerable overheating of the local and long distance phone circuits, there have been two more meetings of the committee, one at the plush New York Yacht Club with Jake as host, and another in the beautifully appointed patent law office of Mel Jenney in Boston. Myriads of details have been settled and the committee has prepared an ideal program at an ideal spot, with provisions for all the attendant services which will make your visit tops in enjoyment. The large number planning to attend indicates that it would be wise to get that reservation in at an early date.

Besides the names listed in the last four issues of *The Review* and in last month's reunion mailing, the following have also indicated probable attendance: Ollie Bardes of Cincinnati, Mich Bawden of Boston, Jim Cudworth of University, Ala., Franklin Flaherty of Wilmington, Del., Walt Hamburger of Boston, Father Ev Harman of Salt Lake City, Joe Kaufman of Boston, Al Kiley of Somerville, Dan

MacNeil of Boston, Lou Mandel of Newark, N.J., Phil Nelles of Malden, Ed Noyes of Philadelphia and Bill Rose of East Orange, N.J. Letters have been returned for Jorge A. Beeche, Professor Charles B. Dicks, Jr., Charles A. Hill, Jr., Henry A. Hutchins, and John R. Oliver. It will be appreciated if anyone knowing their whereabouts will advise your Secretary.

New addresses have been received for Arthur Esner, Harold N. Ewertz, Arthur L. Jackson, Andrew Jensen, Jr., Joseph A. Mahoney, Robert D. Moore, Major William D. Morrison, Albert E. Povah, Michael P. Sinelnikoff, Robert P. Stebbins, and Michael Treschow.

Interesting news has been received concerning: Charles F. Baish, Henry du Pont Baldwin, Oliver L. Bardes, Miles Zoller, George A. Chutter, Frederick S. Dellenbaugh, P. Exton Guckes, Lewis W. Moss, Alfred J. Shaughnessy, John W. Barriger, Frank Blewer, Ralph Cooper, Jack Rule, Thomas W. Bartram, Garvin Bawden, Edward W. Booth, J. Ernest D. Clarkson, John S. Cummings, Benjamin Fisher and Harry A. Goodman. For emergency reasons entirely beyond the control of your Secretary and *The Review*, details on the above cannot be included in this issue. News of these classmates, along with the regretful notices the Secretary has regarding the untimely death of Richard W. Sears, 2d, and Philip Willistine Clark, will appear in the May issue. — CAROLE A. CLARKE, *Secretary*, International Standard Trading Corporation, 67 Broad Street, New York 4, N.Y.

## • 1922 •

All New Englanders know by this time of the tremendous undertaking Frederick S. Blackall has been engaged in in the development that has finally resulted in a certificate of necessity being granted by the National Security Resources Board to the New England Steel Development for the construction of a New England steel mill in the New London area of Connecticut. Fred, first as president of New England Council and subsequently as chairman of the Steel Committee of the New England Council pursued this matter with energy and devotion since 1946. Considering the obstructions in the way of getting a steel mill in New England the fact that it has now been approved is testimony to the great work Fred Blackall has done.

Duncan R. Linsley is now one of the senior vice-presidents of First Boston Corporation. Tom T. Freeman has recently been promoted to the position of Rocky Mountain division manager of the Texas Company. Freeman started with the Texas Company at the Casper, Wyo., Refinery in 1922. William R. Scott is chairman of the Republican Town Committee of Fairfield, Conn. His nomination came without a dissenting vote. Scott is a member of the Foreign Sales Representative Staff at Remington Arms and has lived in Fairfield since 1940.

Oscar Horovitz's success as an amateur movie producer has already been noted in the February issue of *The Review*. Oscar has been at movie making for some time. He first won recognition in 1943 when one

of his circus films was given honorable mention from *Movie Makers*, a magazine specializing in this field. He followed this up with a Ten Best Winner in 1944 — a filmed version of that year's musical comedy success, "Follow the Girls." In 1947, he shifted from the stage to ice, winning an honorable mention with *Ice Follies* of 1947. Then in 1948 Oscar entered a new field. He took an honorable mention for a travelogue on Guatemala. Now in 1950 he has placed among the Ten Best amateur films with his movie of "Ringling Bros. and Barnum & Bailey Circus." To receive an annual award in the Amateur Cinema League as having produced one of the Ten Best films corresponds in this field to the receipt of a Hollywood Oscar. An Oscar for Oscar!

Donald F. Warner, one of G.E.'s jet engine pioneers, is the new designing engineer for the Aircraft Gas Turbine Engineering divisions at the River Works of the General Electric Company. F. Marion Banks, President of Southern California Gas Company, is pictured in a recent issue of *Fortnight* with a brief resumé of his activities in arranging for the laying of a pipe line through residential territory in which there would normally be serious objection were it not handled in a diplomatic manner. The pipe line apparently has been laid and all credit goes to our classmate.

Edward L. Bowles sent a very interesting letter to Beverly Dudley, *The Review* Editor, last fall and this letter while, perhaps, a little out of date is nevertheless so interesting that it is printed verbatim below.

"By way of background: I was asked by Lieutenant General Ed Hull, Director of the Weapons Systems Evaluation Group, Office of the Secretary of Defense, and by H. P. Robertson, Scientific Director of this same body, to head a WSEG mission to General MacArthur's Command — Far East Command. I left Washington early in September for this purpose, taking with me Major General James M. Gavin, Dr. Charles C. Lauritsen of the California Institute of Technology, and Dr. W. B. Schockley of the Bell Telephone Laboratories, and Dr. Edward Smith of the WSEG Headquarters.

"We remained in the Japan-Korea area for the better part of a month. Gavin and I were aboard a large carrier during the Inchon assault, which afforded us an opportunity to observe Navy air. Dr. Lauritsen was aboard a small carrier (ACV) observing Marine air. Gavin and I went ashore on Womi-do Island on D plus 1, and went forward with the Marines up to the point where they were ready to cross the Han River. Lauritsen joined us on this expedition ashore the second day. The three of us flew out of Kimpo Airfield near Seoul on the first Air Force C54 to land there and take off after its recapture. Having been in battledress for about a week, we scrubbed up in Tokyo and put our affairs in order one day, and were off the next for General Walker's and General Partridge's Headquarters in the Pusan-Taegu area.

"Here again we were in the thick of things. We advanced with forward elements of infantry, and in this way we



got firsthand information of the character of infantry combat operations. We also observed tactical air support from the air. Later we were able to go forward and observe on the ground the damage done to the targets we had seen destroyed from the air. Later we spent some time in the Headquarters of General O'Donnell's Strategic Bomber Command, and some time with General Tunner on the Troop Carrier and general airlift problem. This education of our group was fortified by numerous conferences with General MacArthur's staff.

"Our group was given the utmost freedom of operation and complete cooperation of the theater. This enabled us to bring back to the WSEG information which I like to believe will be of substantial consequence in our effort to further increase the effectiveness of our military operations. Incidentally, I am serving the WSEG as Scientific Warfare Adviser."

NEW ADDRESSES: Kendrick P. Coachman, Middle Line Road, R. D. No. 2, Ballston Spa, N.Y.; E. Randolph Haigh, The Greystone, 4842 Ellsworth Avenue, Pittsburgh 13, Pa.; Kenneth F. Morgan, Western Electric Company, 120 Broadway, New York 5; Claus Molbach-Thellefsen, Box 779, Oslo, Norway; Charles E. Starbird, 441 South Johnson Street, Mesa, Ariz.; Reginald W. Edmonds, 197-100-65th Crescent, Flushing, L.I., N.Y.; Professor Joseph H. Keenan, The White House, Trumpington Road, Cambridge, England; George D. Ramsay, 650 La Mirada, San Marino 9, Calif.; Charles G. Rudderham, 2311 Traymore Road, University Heights, 18, Ohio; Keith W. Robbins, Hotel Grande Bretagne, Athens, Greece; Joseph Givner, 25 Beechtree Drive, Larchmont, N.Y. — C. YARLEY CHITTICK, *Secretary*, 77 Franklin Street, Boston 10, Mass. WHITWORTH FERGUSON, *Assistant Secretary*, 333 Ellicott Street, Buffalo 3, N.Y.

## • 1923 •

There was a good turnout of 1923 men at the Alumni Association midwinter meeting, February 1, which started off with a steak dinner at Walker Memorial. George A. Johnson and Ollie Hooper both brought along their sons in accordance with the now well-established custom for this meeting. Among others present, I noted the following but this may not be a complete list: Horatio Sexton, George B. Pease, L. N. Brown, Dave Skinner, Frank Haven, Harold Golding, Joseph Fleischer, Ben Albert and Dick Frazier.

It was announced in January that Richard L. Bowditch, president of C. H. Sprague and Sons, a Boston coal company, and the Sprague Steamship Company, will head the transportation, public utilities, fuel, service and imports and exports division of the Federal Office of Price Stabilization.

Wanton E. Gladding has been personnel manager of Du Pont Company's Nylon Division for the last two years. In January he was named manager of Du Pont's Fiber V plant which is to be built at Kinston, N. C. Gladding has been with the Du Pont Company since 1925. The above information was picked up by George Bricker from a Wilmington, Del.,

paper and in sending it along, I got some information about George's own activities. He is with Robert Heller and Associates, Inc., of Cleveland, and he says it keeps him traveling around the country a good deal. He said he was on the West Coast for a couple of weeks in October and before Christmas, spent 10 days in the hospital in New York for appendicitis. In all, he says his rail and air mileage runs about 50,000 miles a year. He has two daughters, both in college, Jacqueline at Ohio Wesleyan and Betsy at Wellesley.

Monday, June 11, is Alumni Day this year. On that day there will be the annual meeting of the Class at 5:00 P. M. at the Copley Plaza Hotel, Boston. Last year the meeting took about 15 minutes but 30 or 40 persons had a most pleasant reunion during the couple of hours before the annual alumni dinner. Make your plans now for June Alumni Day. — HORATIO BOND, *Secretary*, National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. HOWARD F. RUSSELL, *Assistant Secretary*, Improved Risk Mutuals, South Broadway, White Plains, N.Y.

## • 1926 •

Not a single clipping from the news services this month and only one letter, from Mark Greer whose move to Middle Haddam, Conn., we reported in February. Mark spent 22 years with the Edwin L. Wiegand Company of Pittsburgh, Pa., and was vice-president in charge of engineering. The opportunity came for his company to name a factory representative in Connecticut and Western Massachusetts, so Mark asked for it and was appointed, and it sounds like a nice setup. Jack Larkin recently stopped in to visit the Greers and reports that when the remodeling is complete, there will be a "baronial" estate on the Connecticut River where '26 men can drop in enroute between Boston and New York — and Mark has asked us to do just that. So — Squire Greer, leave the coffee pot on the back of the stove — it's an old New England custom — and we will be dropping by.

With the above paragraph completing the official notes of the Class for this month, there is only one course for your Secretary and that is to compose some notes. It is a raw winter Sunday morning here at Pigeon Cove, so we cannot talk about the flounder fishing or tell about the lobster boats going past our picture window — although one brave fisherman just went out to haul his pots. It's more fitting to say that there is a colorful fire of driftwood crackling in the fireplace and that we are not too far away from it with Kinda, our St. Bernard, at our feet. In such comfortable surroundings, we can relax and talk to you about the subject in which all of us are most interested — our coming reunion. We have previously reported that Al Dolben is our reunion chairman and that the dates are June 9 and 10 at the Hotel Griswold, New London, Conn., returning to the Institute for Alumni Day on Monday, June 11. Al has organized a committee and Jack Larkin has taken on the job of publicity so we will not steal any of his thunder by going into the details. We do want to ramble a bit, reminisce or call it what you may, because this

reunion that is coming up will be a milestone in all of our lives and if any of you have not thought about it that way we hope to convince you.

Personally, I have been fortunate in being able to attend all '26 reunions — largely because I have lived most of the time since graduation right here in Boston. I haven't checked the exact attendance but at most of our reunions about 100 men have returned and it has been pretty much the same 100 each time because having once attended a '26 reunion, no one ever misses the next one by choice. Since our Class graduated about 600, it is obvious that a lot of the boys have been missing out. With our Class spread all over the world, it is easy to reason why so many men have been unable to return for our 5th, 10th, 15th or 20th, but the 25th is different. At our 5th we weren't even dry behind the ears and who had the dough to travel any distance in 1931? That one, you may recall, was at Plymouth and while I don't remember too many details, it at least stands out that we were very frisky and when it was all over, the Class paid for several hotel doors and nearly paid for a piano. However, the activity was transferred to the beach and held under control with a big songfest led by Bob Dean in front of a roaring fire. By 1936, when we had our 10th at Toy Town Tavern in Winchendon, much of the excess vigor had spent itself and we were only billed for one hotel door — the hotel even indicated willingness to have us return for another reunion. A lot of the boys were raising families by then and a tenor of seriousness had gripped the Class. There was a display of good golfing and even some superior tennis matches. A large hobbyhorse, symbol of the Tavern, stood on the golf course and we have some incomparable movies of certain classmates trying to ride it — you will have an opportunity to see these movies in June. Bean Lambert impressed us by arriving in a private plane. By 1941, when we went to Old Lyme, Conn., a large number of the Class were engaged in defense work but we had an excellent turnout nonetheless. How we had settled down in 15 years — not a single hotel door was scratched. The only complaint from the hotel came when some of the boys raided the icebox after midnight — you see by now we were thinking largely of our stomachs. Perhaps that term "largely" should be reserved for our 25th — that is with reference to stomachs — we will see in June! In this connection, a friend of mine recently told me of a lecture he had received from his doctor, an 80-year-old proper Bostonian who is a graduate of Harvard. He tells of the lithe figures of his classmates at his 5th and 10th reunions but by the 15th quite a number had started to show signs of girth. At his 25th these men were described as portly. A few years ago, the doctor attended his 50th reunion and relates that his classmates were all slim once again as they were at their 5th and 10th, but goes on to explain that this was simply because the portly fellows were not around any longer. In spite of this, there will be arrangements for a midnight snack at our



25th since this became an accepted institution at our 20th. However, conditions at our 20th were somewhat different and we had to fatten up some of the boys. Dave Shephard, in particular, was over from England looking like a withered string-bean after the austerity of a British wartime diet, but with the start we gave him at the reunion he made a very quick recovery and a year later was his handsome self again. That 20th reunion really was an affair. Everyone had the most enjoyable time on record. Admittedly, the weather was ideal, the Wianno Club was a grand spot, the war was over, there was no depression and all conditions added up to perfection. However, there was something more—the Class had really matured. Our Class had weathered a pretty rough 20 years and weathered it well. Responsibility had fallen upon the Class, in varying degrees to be sure, but everyone was now shouldering real responsibilities and many had sons and daughters in college. To reunite with the same old gang and reminisce about the good old days at the Institute seemed to be the order of the day. No one was concerned about the relative success of anyone else other than “what are you doing these days, Bill”—“Oh, I’m in the contracting business—this is the 18th year.” If Bill had made a million bucks that did not matter, for this was a reunion of old friends and as such the moments were priceless. As a matter of fact, to me the most impressive part of a reunion is how we sit around and crowd a large segment of a lifetime into a few hours. Men who were close friends for four years or who at least rubbed elbows during that period, which seems just yesterday, get together once again and shed today’s responsibilities for those we carried as students. Although many of us have been known to “admit” to strangers that M.I.T. was a tough grind and, therefore, that we must have killed ourselves to get through, you hear nothing about that at a reunion because everyone knows the score and no one seems to remember much about being overworked. Of course, some of us may have had difficulty at times in making the grade but it always comes out in retrospect at a reunion that this was generally the result of underwork rather than overwork. The elaborate radio building programs that went on in the dormitories, the fraternity bull sessions, the hours spent on Tech Show, *Technique*, *The Tech*, Glee Club trips, and so on, are subjects that come up for discussion at reunions and result in once again burning the midnight oil. Reunion plans, as previously mentioned, call for two days of this sort of get-together at the Griswold in New London, Conn., Saturday and Sunday, June 9 and 10. On Monday, June 11, we return to Cambridge for Alumni Day and for those of you who have not been back for some time this will be an eye opener. Last week, I had a business acquaintance drop in from Chicago and after dinner drove him across the river for a quickie view of the Institute, but we did not go over Harvard Bridge. To view the Institute now, one starts from Cottage Farm Bridge since the river front from there straight through to West Boston Bridge is now M.I.T. The

boat house, which in our time was an outpost, is now practically on the campus. Across from it, we started with the Supersonic Laboratory, then the temporary Westgate housing facility for married students, the Riverside apartments recently purchased and remodelled for dormitories, the Baker House for seniors, The Graduate House (formerly Riverbank Court Hotel) and finally we arrived at the Institute, as you and I knew it in 1926. However, tucked in between Walker Memorial and the Institute is the new Charles Hayden Memorial Library. After Walker, we came to the President’s House, which, of course, is now Jim Killian’s domicile. We kept on and no longer is it necessary to apologize for the ramshackle exhibition buildings that used to adjoin M.I.T., for this is now Institute land and on it rises an impressive, extremely modern 12-story apartment building where many professors now live and where Dr. Compton makes his home in the penthouse. Then we came to the fine building, formerly Lever House, but recently acquired by the Institute to house the new School of Industrial Management, established with the magnificent gift of the Sloan Foundation. But this drive along the river is only the front view—in depth, the Institute has likewise grown with the swimming pool, the cage, the buildings along Vassar Street housing the cyclotron, the new Van de Graaff generator, the electronics laboratory, the Chemical Engineering building, the Sloan Automotive Laboratory and countless others together with the new ones being started with funds from the Development Drive. In outlining this vast growth of the Institute since 1926, we have just hit the high spots but even that will give you a preview of what will unfold before your eyes on Alumni Day, and schedules will be so arranged that you can see as much of it as you wish. We will talk more about Alumni Day activities in the May issue, and you will receive notices of these activities in addition to reunion notices. It is a part of our 25th that none of us can think of omitting and, of course, will be climaxed with the presentation of our class gift at the Copley Plaza as the result of the generosity of all of you. It’s going to be a week end that we will always remember as one of the most important events of our lives—Al Dolben and his committee are hard at work to assure you of this. There will be only one more issue of class notes that will reach you before reunion, especially those of you who are at great distances, but there will be three or four mailings from Al Dolben and Jack Larkin. However, if there is anything your Secretary can do to assist such as looking up the address of an old classmate you want to arrange to meet, just drop us a note.—GEORGE WARREN SMITH, *General Secretary*, E. I. Du Pont de Nemours and Company, Room 1420, 140 Federal Street, Boston, Mass.

#### • 1943 •

I regret that I have been unable to prepare the class notes for the last two issues of *The Review*. When one due date was approaching I was in the hospital. Then, Christmas rolled around and in its wake long hours and tedious days pre-

paring for the January directors meeting at Champion. But this time it’s different.

Let’s turn first to Cupid’s doings. The engagement of Margaret Anne Butler and Whitney Newton, 2d, was announced in October by the bride’s parents. Margaret Anne’s home is Wilmette, Ill., and she went to college at Miami University in Oxford, Ohio, and to the University of Denver. The news clipping from which I am taking the information says that the couple were planning on a December wedding. From her parent’s home in New York, the announcement of Gloria Welch’s engagement to Robert B. Case, M.D., was made last November. Miss Welch, an alumna of Foxcroft School is at present a senior at Sarah Lawrence College. Dr. Bob is an assistant resident physician at St. Luke’s Hospital in New York. Married in January were the former Lydia Marion Mershon and Herbert M. Johnson. Herb’s bride graduated from Connecticut College for Women in February, 1949, and then went to work for the General Electric Company in Schenectady. Herb is with the Sangamo Electric Company in Springfield, Ill. From North Arlington, N.J., I have a newspaper clipping telling that Jean Harris’ engagement to David Crawford has been announced by her mother. Dave is with the International Business Machines Corporation in Poughkeepsie. The engagement of Sarah Spofford Beadle and Frederick A. Wolff has been publicly announced by the bride’s parents. Sarah’s home is in Wilmington, Del., and she is a graduate of Vassar College.

At a Christmas day wedding in the Church of Our Savior in Akron, Ohio, the former Patricia Jean Land and James Robert Casserly were married. The bride’s father is the rector of the church and he performed the ceremony. Jim’s bride is a junior at Smith College.

A post card received during December from Walter C. McCarthy reads as follows: “Can’t resist broadcasting the news of the birth of our first child—a son, George Pitkin on November 24. We’re out here in Seattle where I am teaching at the University of Washington. There is something about this Pacific Northwest that’s grand!” Congratulations to the McCarthy’s! A. J. Mestier, Jr., who has been with the Allis Chalmers Manufacturing Company since he left the Army in 1946, has been appointed manager of the Allis Chalmers Syracuse district office. Prior to this move he had been a sales representative in the New York district office.

Beryl Roberts in her capacity as director of health education for the Cancer Society in Massachusetts has prepared a cancer education program comprising a speaker, films and other exhibits which is in great demand in Massachusetts, having been given to more than 220 clubs, schools, and industrial establishments. Miss Roberts developed the program as a part of her course in health education which she teaches at the Harvard School of Public Health. She teaches also at the University of Maine during the summer.

As a result of the retirement of the president of Dick Brothers, Inc., and the succession of lesser changes it initiates, Herman A. Perlmutter and his father

have assumed management of the corporation. Since the war, Perlmutter has been associated with the Ferro Metal and Chemical Corporation in New York. Al Emond has at long last come out of hiding! He wrote me a long letter a few weeks ago and his saga is as follows. After being released from the Army he and his wife decided that California was the place to live and he joined a printing ink company as an ink chemist. He stayed with this outfit for about a year formulating inks, at the end of which time he transferred to the Sherwin-Williams Company. He is still with them and finds paints more fascinating than inks. His new post is chief industrial chemist in Sherwin-Williams' Oakland laboratory. His duties involve considerable work with the sales department, particularly in the development of 'custom' finishes to meet a particular customer's requirements. The Emond's young son, Bruce Carlton was born about a year and a half ago. And to quote Al he is 'the best little boy in the world.' So long, Chums. — CLINTON C. KEMP, *General Secretary*, 29 Verlynn Avenue, Hamilton, Ohio.

### • 1945 •

While looking through the clippings Dave Flood recently sent to me, along with other secretarial material he had accumulated in five years, I came across the following engagement and marriage notices. The first marriage of note is that of Jumper Gammon to Marion Morreell, daughter of Admiral and Mrs. Morreell, on December 29, 1948, at the Calvary Episcopal Church in Pittsburgh. As regards the groom — Jumper, after getting out of the Navy in 1946, went back to the Institute and received a B.S. in Course XV, after which he worked for the Mellon Institute; he is now employed by Jones and Laughlin Steel Corporation in Pittsburgh. We have two other boys in Course X to report on. The first is Harold Thorkilson who married Lois Dorothea Gillette in Tenafly, N. J., on April 21, 1950; Hal and Lois went to Bermuda on their wedding trip and now reside in Ridfield Village, Metuchen, N. J. The other Course X man is Bill Pockman who married Greta Hughes of Troga, Pa., on June 17. Other marriages to report are those of Bill Loeb, II, to Stella Munzer on June 12, 1948; Albert Shelby to Elizabeth Griffither of South Orange, N. J., on March 4, 1950; Bill Revoir to Lois Heffernan of New Britain, Conn., on June 10; Joe Oechsle to Nancy Drake of Germantown, Pa., on March 3, 1950; Tom McNamara to Louise Downey in Boston on April 15, 1950; Ross Graves to Marian Hamer on May 6, 1950; and Walter Nason to Charlotte Collyer of North Weymouth, Mass., on December 28, 1950. One engagement to report is that of Charles H. Hart to Nancy Heeger of Arlington; a spring wedding is planned.

We recently mentioned that we hoped that those fellows who were associated with our Class throughout most of their Institute days but, "due to circumstances beyond their control" graduated with another class, would rejoin our group.

I am glad to say that I can report that the following have taken the big step and I hope that many many more follow in their footsteps; Brownie Brown now of the New Britain Machine Company who lives in Southington, Conn., with his charming wife, Lil, and a couple of little male Brownies; Buzz Buzby who after finishing up at Technology received a degree in geological and petroleum engineering down in Oklahoma where he married Lois Martin of Norman, Okla., back in June, 1948, and is now self-employed as a consultant engineer; H. Paul Grant of Arlington, Mass., and ex-Voo Doo fame; Bud Hetrick of Armstrong Cork Company in Detroit; Bill Martin, II, who is happily married and lives in Waltham, Mass.; Pete Quattrochi, who has his own automobile agency out in Pittsfield, Mass.; Pete Schwab of Sperry Gyroscope Company; Bill Shuman up in Nashua, N. H.; Lloyd Turoff of Providence, R.I.; Ross Compton down in Herndon, Va.; Frankie Strobino in Dayton, Ohio; and Jephtha Wade, the only boy to marry a classmate, now living in Cambridge. While on the subject of class affiliation you might be interested to know that I tried to get Otto Kirchner back into the fold last spring, but Otto as you probably know is Alumni Council Representative for the Class of 1949 and thus he felt he should remain with that Class for the present.

Many of you have probably often wondered whatever happened to Kirk Drumheller, elected class president back in 1945. Kirk dropped me a note last spring the bulk of which is repeated below. After serving his time in the Navy, Kirk came back east and received his M.B.A. degree at the Harvard Business School, but managed to spend a summer up in Alaska along with Bill Scott '43. At the time he wrote last spring, Kirk was dickering with the thought of buying a ready-mixed concrete plant, but his idea must have fallen through, for the last I heard he was working for Brown Trailers, Inc., in Spokane, Wash. Kirk married Betty Louise Vaara in Anchorage, Alaska, last June 17. He had hoped some of us could get up to the wedding, but he must have realized none of us are too adept at driving dog sleds through the Alaskan spring thaw. I am certain you all remember Nick Mumford so I shall tell you what I know about him. After midshipmen's school, Nick was stationed aboard the U.S.S. *Pocono* where he sat out the war under the Brooklyn Bridge. In the fall of 1946 Nick went back to Technology and received his M.S. the following June in Mechanical Engineering specializing in supersonic flow. While taking graduate work, Nick became engaged to Rosemary Davis; but as those of you who were at the Statler, Alumni Day 1947, will remember Nick was not going to get married until 1948 at the earliest. You guessed it, he was married two weeks later. Nick has been with Chance-Vought Aircraft since leaving Technology, first in Stratford, Conn., and for the past two and a half years in Dallas, Texas. Nick and Rosemary have two strapping youths to boot. I might add that Mumford would be run out of Texas if I

should ever reveal his sentiments as regards the noble state. Why don't you come back up north, Nick!

Getting back to the green sheets sent out a year ago, Jim Barrabee married Marcia Wolper of Brookline, Mass., on June 22, 1948. Jim is foundry production research engineer with International Harvester in Richmond, Ind. Quite possibly some of you read Jim's article, "Melts Steel in Oxygen — City Gas Fired Crucible Furnace" which appeared in the December, 1949, issue of the *American Foundryman*. Elaine Bickford reports that she married Roger Bart '46 on January 29, 1949. Last spring she was teaching at Simmons after receiving her M. S. in Chemistry at Technology in September, 1948. Ted Blakeslee wrote that he married Virginia Arther in New Haven back in July, 1946. Ted and Virginia have a son Ted 3d, born in November, 1948. After leaving Technology, Ted worked for George G. Sharp, naval architect in New York, for 15 months, but since that time has been teaching at Lafayette College in Easton, Pa. Can you imagine T.R. teaching thermo? Walt Borden reported that he married Margot Fern in February, 1947, and that he is working for Esso Standard Oil Company in Bayonne, N.J. Jim Brayton married Eillen Kiskaddon (those of you that went to midshipmen's school at Columbia probably remember her brother) on February 26, 1949, with Pete Hickey helping out in the ceremony. Jim has been with Turner Construction Company since his Navy days and spent a couple of years in Boston working on the John Hancock building. At present Jim, Eillen, and Flint 2d are in Connecticut. Bob Bronson married Helen Louise Affler back in September, 1946, and they are the proud parents of three children — Bob, Mary, and Julie. Bob is with American Sterilizer Company in Erie, Pa., and recently qualified for his professional engineer's license. Vin Butler reports that he is still carefree and single and enjoys his work with W. P. Fuller and Co. in Frisco.

Frank Carroll's green sheet indicates that he was working for Dennison Manufacturing Company in Framingham, Mass., but I was talking to his uncle the other day and he reports that Frank is in charge of the science department in one of the Boston high schools. Ralph Cromer married Rosamond Mulhall in September, 1948; they are the proud parents of Patricia Elizabeth born in July, 1949. Ralph is with Peoples Water and Gas Company of Miami Beach. George Dvorak reports that he married Mary Jo Forsell in July, 1947 and that they have a daughter Carolyn Janice. George works at Boeing along with Bob Hildebrand. Bob married Virginia Ferguson in June, 1948, and they have had one child, born last summer. Probably many of you have wondered what has happened to your class agent. Well, Al Oxenham married Louise Leslie in June, 1947; they have a son Peter, age two and a half years. Al has been with Monsanto Chemical Company, having recently moved from Levittown, Long Island, to Pittsburgh.



Tom Hewson, our class representative to the Alumni Council, married Elizabeth Gurley after graduation in 1945. After working at the Institute for a while, Tom has settled at Lassells and Associates on Commonwealth Avenue in Boston. Art Hall reports that he has been batting around the country for G.L. Cabot, Inc., of Boston, and that he has finally come back to rest in beantown. Art married Catherine Whitty in April 1947 and they are the parents of two boys. Guy Gilleland reports that he is still single and is with Moore Pipe and Sprinkler Company in Jacksonville, Fla. Hartmann J. Kircher is with Reaction Motors, Inc., in Rockaway, N.J. Kirch married Blanche Borkstrom in September, 1947 and they have a daughter Kathy. Daper Landon is with Continental Can Company down in Wilmington, Del. Bob Hibbard reports that he is happily married with several children which take up his spare moments when away from Du Pont.

Bill McKay will be making his first appearance next month so you can look forward to plenty of news. How about giving your officers a little support by paying particular attention to President Chick Street's letter when you receive it later this month. — CLINTON H. SPRINGER, *Secretary*, 44 Church Street, Bristol, R.I. *Assistant Secretaries*: WILLIAM J. MCKAY, 15 Barrett Street, Needham, Mass.; EDWARD STOLTZ, JR., Johns-Manville Sales Corporation, 505 Laconia Building, Wheeling, W. Va.

### • 1946 (6-46, 9-46) •

Five years after the four happiest ones finds the Class of 1946 in pretty much the same boat as that day when they first walked up the marble steps off Massachusetts Avenue. Back in those days, all we thought about was how much of Technology we would have under our belts before our favorite Uncle thought we had enough. The only change today is that we count our children rather than semesters. Uncle's wishes are still the same. The moving finger writes, and having writ decides to write the whole thing over again. Some things have changed for the better. Instead of Friday morning quizzes and Friday night fraternity paddles, we think of mortgage payments and obstetrician bills. The only trouble with that is that it doesn't leave much time to keep in touch with the old gang. You don't have to be elected to the board of General Motors though, to write to us.

Russell Werby, 9-46, recently gave a public lecture entitled, "The Atomic Bomb and You" in his home town of Lexington, Mass. This modern minute man knows his musket. Russ is a consulting engineer working in the civil defense program. Among recent marriages were those of John Bateman, 6-46, and James Coffey, 6-46. John who married Rose Ann Perfetti of Ansonia, Conn., is presently an engineer at the Farrel-Birmingham Company. Jim, an instructor at the University of Massachu-

setts, married Regina Lawler of North Brookfield, Mass. Good luck to them all. Ralph Berman, 6-46, has become engaged to Miriam Schwartz of Hollis, N.Y. Ralph aspired for more than a mere slipstick and has received his Master of Arts degree from Cornell University. Harold Jacobson, 9-46, plans a July wedding to Marilyn Rosenthal of nearby Newton, and John McLarty, 9-46, was engaged to Patricia Walker of Cleveland Heights, Ohio.

Your reporter is busily engaged in starting up a plant for the manufacture of microwave test equipment. We call ourselves Microlab, and if you should hear of anyone who happens to need some microwave test equipment (you never can tell nowadays) just let us know. Please keep in touch with us. It takes just a minute between the diaper and the bottle. Enough of those minutes from enough of you fellows will keep this column on a more regular basis.

The Assistant Secretary writes: My messenger (a rather slow, rheumatic penguin) has had a touch of the typical seasonal malady and most of his news is a report on romance and spring. We send our best to Elizabeth Ann High who will be five months old on the 11th of this month and who is the daughter of Elizabeth and John (lieutenant, j.g.) High.

The "paper anniversary" club since winter snows began has included Stanley and Vivian Rice, Robert and Ruth (Gilbert) Shaeffer in December, Roger and Rose Drexel in January, Angus and Phyllis MacDonald in March, and Harry and Barbara Augenblick this month.

The penguin aforementioned murmurs that Marvin Sparrow and Dorothy Goldman of Brookline are planning on a marriage around this time, and William Gage and Shirley Gavin of Mattapan are of the same mind.

The reunion's the thing, classmates. And recall, please, that ideas are not bones — so do not bury them. We want to hear from you. — HARRY A. AUGENBLICK, JR., *General Secretary*, 301 South Ridgewood Road, South Orange, N.J. JAMES W. CHURCH, *Assistant Secretary*, Box 97, Cabin John, Md.

### • 1950 •

I'm afraid this will have to be a short column because of lack of news. Now I want all you lucky civilians to sit down and write us a letter telling of your whereabouts and jobs. For you Army and Navy men, write and tell us where you are. Let's have the mail come pouring in and then we can fill this column with news about all of you.

Ellen Duff, a senior at Emerson College, was engaged to Harlan Pickering early in January. Another January engagement is that of Jeanne Shay and Alfred Bloom. A June wedding is planned by Eloise Martell and Roger Milligan. Roger is currently employed as an aeronautical engineer for the Boeing Aircraft Corporation in Seattle, Wash. Louise

Mildred Herron and Robert Titus announced their engagement and have tentatively scheduled their wedding for April 26. Bob is employed by Allis Chalmers in Hyde Park, Mass. Evelyn Swanson and Cadet Thomas Courant have announced their engagement. Tom attended Technology for two years and then entered West Point where he is now in his junior year. Henry Skillman, who is now attending the Temple University School of Law, announced his engagement to Sarah Ann Moor. Anne Nicholson, a Simmons girl, and Dimitrios George Dimitriou announced their engagement early in January. Donna Betty Foley, a senior at Tufts College and William Anderson also announced their engagement in early January.

I received a very interesting letter from Dick Ahern last month and would like to reprint part of it to tell you how Dick is making out: "Last September I sailed for Europe, landing in Rotterdam, where I bought a bike and took a month to cycle all the way to Graz, Austria, up the Rhine River and over the Alps. At Graz, I am enrolled in the department of architecture of the Technical Institute, where I'll study for a year." He goes on to say that he's visited Italy, Greece and Turkey on his numerous vacations, but that he is painlessly absorbing what they are teaching at the Institute.

Duke Thomas wrote and informed me that he is in boot camp at Great Lakes. He grabbed a blue suit before Uncle Sam gave him a brown one. Dave Vollmer and his wife are very happy with Corning, N.Y. Dave is with the Corning Glass Works and writes that they have wonderful office parties at Christmastime. Phil Byrne writes from Rochester that he and Jean Fleming have set the date for April 28. Phil is now working in the timestudy department at Delco. John O'Neill writes from Buffalo that he and Peggy finally finished his thesis and moved to their new location. John is doing research work for the film research laboratory of Du Pont.

I also got my monthly communique from Colombia, S.A. Nano Romaquera writes that: "Believe it or not, I'm actually working here. I didn't know that I was to use all the stuff I learned at Technology, but darn it if I'm not using it now. I had to design journal bearings for a 10-inch diameter shaft and that took me two days."

I was in Baltimore last week end and visited Father Ryan, the former chaplain of the Catholic Club. He's enjoying life in Baltimore but he rather misses the old crowd. He sends his regards. As for me, I'm still in training at Fort Belvoir. Bob Mahar'49 is now down here taking the same training. The last I heard, Gene Comeau was at Fort Meyer waiting to be shipped someplace. I haven't run into any new M.I.T. faces in uniform for some time now. Don't forget to write. — JOHN T. WEAVER, *General Secretary*, 1772 East Tremont Ave., Bronx, N.Y.

*For emergency reasons completely beyond the control of The Review and its able corps of Class and Club Secretaries, certain material received and normally scheduled for publication in this issue has been omitted this month. So far as is possible, the omitted notes will be included in future issues of The Review. The Review wishes to acknowledge the understanding of those Secretaries whose labors have been affected.*





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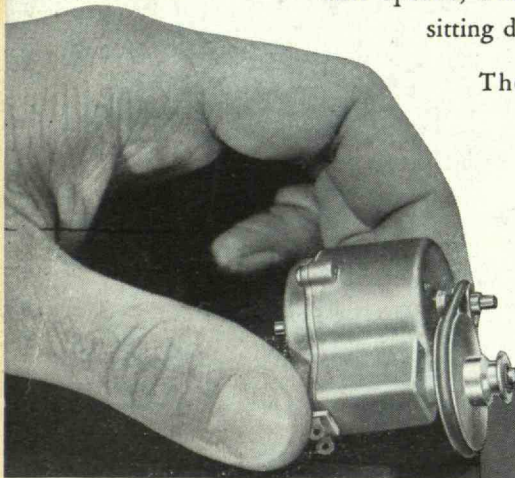
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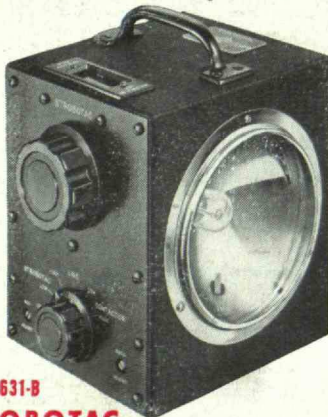
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